

Review of the Biosecurity South Australia Apiaries Program

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31 October 2011

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Contents

	Page
Executive summary	3
List of Recommendations	5
1 Introduction	7
1. Background	8
2.1 Reason for review	8
2.2 Terms of reference	8
2.3 Policy environment	8
2.4 Apiary Industry in South Australia	11
3 Biosecurity risks facing the apiary industry	14
3.1 Exotic threats	14
3.2 Endemic pest and diseases	17
4 Current Biosecurity SA apiary program	20
5 Overview of apiary programs in other States	28
6 Results of Consultation Conducted	31
7 Key findings, discussion and recommendations	41
8 Resources required and potential industry funding mechanisms	49
9 Implementation issues	52
Attachment 1 References	55
Attachment 2 Individuals and organisations consulted	56
Attachment 3 SA Apiary Registration Statistics	58
Attachment 4 Biosecurity Risk Factors for the Apiary Industry	60

Executive summary

This report presents the findings and recommendations arising from a review of Biosecurity South Australia's Apiary program conducted during September-October 2011.

Biosecurity SA is currently consulting with livestock industries about implementing cost recovery within its Animal Health program. The potential impact on the apiary industry is significant and hence Biosecurity SA decided to undertake a comprehensive review of the apiaries program to support further discussion with industry.

South Australia has a valuable and forward thinking apiary industry that places great value on biosecurity to support industry competitiveness. The industry is supported by a government apiary program that is staffed by people who are passionate about the industry and extremely hard working.

The SA industry has good levels of disease control and low levels of chemical residues. The former supports industry efficiency and the latter is valued by the food industry, given the higher levels of chemical residues seen in honey from other states.

However, despite the existence of an industry strategic plan, the Biosecurity SA apiary program suffers from the lack of a documented project plan for its own apiary operations that includes aims, objectives, methodology and key deliverables. There is also a lack of clearly documented policy on key biosecurity risks to the industry.

An analysis of current activities within the program indicates:

- a) A lack of strategic fit with the overall direction of biosecurity within SA and nationally. Specifically, there is an over-emphasis on controlling an endemic disease, AFB, rather than prevention, surveillance and preparedness for serious exotic pests and diseases.
- b) There are insufficient resources, particularly field resources, to adequately carry out the range of activities being attempted. This is exacerbated by one field staff member having to perform some policy type roles.
- c) There is significant potential to make current operations more efficient and responsive to clients through use of technology and alternative delivery mechanisms.
- d) Emergency response preparedness has been neglected owing to competing priorities.
- e) The surveillance program is too narrowly focused (not unique to SA).
- f) There is limited reporting of outcomes and achievements.
- g) Information provision to industry could be significantly improved, both in terms of passive methods (information on the web) and active provision of information to industry.

All industry sectors are particularly concerned about the impacts of a potential (many say inevitable) Varroa mite incursion. Specific impacts would be lowered production, increased management costs, reduced pollination from feral honeybees and an under-supply of paid pollination services. The industry is unlikely to be able to meet the demand for pollination services, especially in the short to medium term.

There is general agreement that the apiary program should be redesigned, with a much greater emphasis on prevention, surveillance and preparedness for exotic pests (particularly Varroa mite) and that endemic disease control should be largely an industry responsibility supported by efficient testing, reporting and education. However a redesigned program should attempt to maintain the current competitive advantages enjoyed by the industry and there needs to be an increased emphasis within the program on measuring and reporting outcomes.

If it is accepted that endemic disease control is a lower priority for government than exotic disease preparedness and surveillance, then the challenge is to design a program that enables industry to maintain the existing high standards and thus a competitive advantage. In general, this means designing systems that encourage and support industry management.

The current specialist apiary human resources are less than what is required to carry out current program activities and, even with program restructuring, marginal in terms of the level required to maintain an adequate capacity and capability to respond to new & emerging issues. Two full time officers is considered more appropriate than the current arrangement (1.6 full time equivalents), so that the range of issues to be covered (including officers' leave) can be managed more effectively, and that national performance standards or baseline capacity can be maintained.

There is inadequate recruitment and utilization of industry resources and expertise to support the apiary program. This applies particularly in the areas of education, surveillance and participation in response teams. There are a number of opportunities to make improvements in this area. Particular initiatives that should be progressed are recruitment of apiarists to conduct regular exotic disease surveillance (especially in high risk areas); recruitment of apiarists onto a rapid response team; and support for industry to run training programs.

There is strong support amongst stakeholders for the broad application of quality assurance throughout the industry. However, while some stakeholders advocate government mandating of QA, this is not a universal view and, importantly, is seen as difficult to justify from a government perspective. Incentives and/or market signals through the supply chain were regarded by many of those consulted as most appropriate. This reviewer could not mount a compelling argument for direct government intervention in this area.

There are significant concerns regarding the ability of the apiary industry to pay the full costs of the apiary program, given the size of the industry and its profitability. Full cost recovery would amount to up 10% of the current industry operating surplus. A revised cost recovery and service delivery strategy is discussed given that the new focus for the program will change the government expectation of what is an appropriate level of industry contribution. Also discussed is a suggested contribution from agricultural / horticultural industries in light of the fact that they will suffer significantly from the effects of a Varroa mite incursion as a result of die-off of feral honeybee populations.

Twenty one recommendations are made to help address the issues identified. Also provided are a number of practical implementation suggestions and options for the design of a revised AFB control program.

List of Recommendations

Recommendation 1. Biosecurity SA should maintain an apiary program that supports the current competitiveness of the SA apiary industry.

Recommendation 2. Biosecurity SA should develop a project plan for its apiary program that has clear aims, objectives, methodology and key deliverables.

Recommendation 3. Biosecurity SA should include clear policy statements within its web pages in relation to each notifiable disease to inform apiarists of their responsibilities and actions that may be taken by government.

Recommendation 4. The Biosecurity SA apiary program should be redesigned so that the major emphasis is on prevention, surveillance and preparedness for exotic pests (particularly Varroa mite).

Recommendation 5. The AFB components of the revised program should attempt to maintain the current relatively low prevalence levels, but should also include a major shift towards industry responsibility for managing this endemic pest.

Recommendation 6. There should be increased emphasis within the project plan on measuring and reporting outcomes.

Recommendation 7. Project design should match available resources to deliverables, with lower priority areas being dropped off when insufficient resources are available.

Recommendation 8. Program methodology should place a greater emphasis on facilitation, education and information provision, rather than regulatory activity.

Recommendation 9. The Biosecurity SA web pages in relation to apiaries should be redesigned to be more responsive to client needs.

Recommendation 10. That the potential for development of on-line and other electronic processes & systems be further examined.

Recommendation 11. That implementation of an apiary identification code system within the apiary industry be further investigated.

Recommendation 12. That the current number of specialist apiary officers is increased to two full-time officers, or equivalent, subject to funding availability.

Recommendation 13. There should be a clearer separation of roles within the program, particularly in the areas of policy development and support for industry advisory / management structures.

Recommendation 14. That industry is supported to make a greater in-kind contribution to the apiary programs, particularly in the areas of surveillance, emergency preparedness and education.

Recommendation 15. That access to government facilities or land by industry for the purposes of conducting training programs is investigated.

Recommendation 16. That discussions be held with Victoria regarding possible joint management of, utilisation or contribution to that State's Quarantine Response Team.

Recommendation 17. Government programs should encourage the use of third party audited QA programs within the apiary industry, however they should not be mandated.

Recommendation 18. That the level of cost recovery from the apiary industry be re-examined in light of the suggested changes to the focus of the apiary program.

Recommendation 19. That contribution of agricultural / horticultural industries to funding prevention, surveillance and preparedness for Varroa mites be further examined.

Recommendation 20. That full, direct cost recovery be implemented for cases where on-ground regulatory intervention needs to be taken against recalcitrant apiarists.

Recommendation 21. That use of third party providers under the direction of an inspector be investigated for some regulatory field operations, for example clean up of AFB or abandoned / neglected hives.

1. Introduction

This report presents the findings and recommendations arising from a review of Biosecurity South Australia's Apiary program conducted during September-October 2011 according to the terms of reference listed in the following section.

Primary sources of information for the review were written documentation of the program and other reports of relevance, as well as interviews and meetings with staff and stakeholders. Key documents referred to are listed in attachment 1. Individuals and organisation consulted are listed in Attachment 2.

Within the context of this review, Biosecurity is defined as "the protection of the economy, environment, social amenity and public health from negative impacts of pests and diseases".

The conclusions and recommendations contained in this report are those of the reviewer and do not represent South Australian government policy.

2. Background

2.1 Reason for review

In line with South Australia Government policy, Biosecurity SA is currently consulting with livestock industries about implementing cost recovery within its Animal Health program. This will include moving to 100 percent cost recovery of the discretionary endemic disease management projects funded by the sheep, cattle and apiary industries and recovering a proportion of the surveillance and emergency preparedness subprograms in all sectors.

The potential impact on the apiary industry is significant and hence Biosecurity SA decided to undertake a comprehensive review of the apiaries program to support further discussion with industry with a view to establishing a sustainable and effective program into the future.

2.2 Terms of reference

1. Examine and review the current apiaries program activities in Biosecurity SA, with a focus on identifying potential efficiencies, alternate delivery arrangements and impact of the program.
2. Consult with industry and government organisations on requirements for a comprehensive and robust apiaries program to effectively address biosecurity threats into the future, including consulting with both the apiary industry and plant industries requiring pollination services.
3. Determine and recommend the structure and scope of a future apiaries program, including the requirement for policy, operational and regulatory services.
4. Provide advice on the resources required and potential industry funding mechanisms to recover the costs of the recommended apiaries program.

2.3 Policy environment

The mission of Biosecurity SA is to “minimize risks from priority pests, diseases and contaminants through effective and efficient prevention, preparedness, response and management with our industry, community and government partners”.

Within its business plan, priority areas are (in summary):

1. Partnerships with government, industry and community to build shared vision and responsibility.
2. Build biosecurity capability and capacity.
3. Prevent, prepare to respond, and/or manage pests, diseases, contaminants, food safety risks and emergencies.
4. Surveillance for high priority threats.
5. Positively influence state and national policies, commitments and agendas.
6. Develop people, services and business practices.

Biosecurity SA is also working within the national biosecurity system to implement the National Intergovernmental Agreement on Biosecurity, which has as its objectives (in summary):

1. Reducing the likelihood of significant exotic pests and diseases from entering, becoming established or spreading in Australia.
2. Preparedness for effective responses and management of exotic and emerging pests and diseases that enter, establish or spread in Australia.
3. Ensuring that, where appropriate, significant pests and diseases already in Australia are contained, suppressed or otherwise managed.

A sub-text or flow-on from these overarching priorities and objectives is a significant change that has been occurring within the national biosecurity system in recent years. That is, within the spectrum of biosecurity activity:

Prevention ↔ surveillance ↔ preparedness ↔ response ↔ ongoing management

there has been a shift in emphasis away from government investment in ongoing management programs for established pest and diseases towards more emphasis on prevention / surveillance / preparedness / response. Under the “shared responsibility” principle, industry has been expected to assume greater responsibility for managing established pests and diseases.

From a national perspective, the priorities from the Commonwealth are early reporting of disease and response preparedness. The Commonwealth supports routine border controls with enhanced surveillance around ports through the sentinel hive program (currently under review).

Another key national policy imperative is the issue of performance standards and baseline capacity. A requirement of agencies under the Emergency Animal Disease Response Agreement (EADRA) and the Emergency Plant Pest Response Deed (EPPRD) (management of bee emergency responses has recently moved from the former to the latter) is that they maintain a capability to respond to pests and diseases listed under the Deed. Performance standards in a range of areas have also been defined in the animal health area. While adequate baseline capacity has proven difficult to define, nevertheless, there is an expectation that agencies will maintain the capacity to respond.

As noted in the previous section, South Australia Government policy is that its animal health programs will progressively move to full or partial cost recovery depending on the nature of particular projects, with a view to ensuring the ongoing provision of and improvements to disease surveillance and emergency preparedness. The policy framework for this move is laid out in the PIRSA Cost Recovery Policy, which outlines 11 principles for application of cost recovery. Two of the key principles state in part that:

- (1) PIRSA should set charges to recover all the costs of products or services where it is efficient to do so, with partial cost recovery during phase in periods, where there are government endorsed community service obligations or for explicit policy purposes; and
- (2) Any charges should reflect the costs of providing the product or service and should generally be imposed on a fee-for-service basis or, where efficient, as a levy.

An economic analysis of the SA animal health program was also conducted by ACIL Tasman to assist PIRSA in making decisions about cost recovery. The report estimates that the benefits of the \$8.7million animal health program are \$412.3 million. Further, the total program cost that should be recovered from industry is \$7.5 million, leaving an additional \$5.1 million to be collected given the current level of cost recovery. The SA government has since made a decision to retain the additional targets announced in the 2010 budget - \$750,000 in savings and \$3.32 million additional revenue, giving a total of \$4.07 million.

The proposed legal mechanism for applying cost recovery to animal health programs is described in the *Draft Livestock Bill 2011*. The three primary mechanisms for cost recovery are:

- (1) Under the Primary Industry Funding Schemes Act (PIFS) which makes provision for establishing funds through a levy system to generate resources for industry development activities. The funds include an industry oversight mechanism and include an “opt-out” provision. These funds are currently used for biosecurity disease management but not exotic disease surveillance and emergency preparedness. However this purpose can change, subject to industry agreement.
- (2) Cost recovery for Property Identification Code (PIC) registration. This covers part of the cost of the PIC administration processes.
- (3) A proposed biosecurity fee to be introduced under the *Livestock Act 1997*. This will be used primarily to fund exotic disease surveillance and emergency preparedness.

The document provides estimates of revenue required to fund current programs. Specifically for the apiary program, a summary for the three funding sources is provided in the table below.

Funding Source	Current revenue	Proposed Revenue by 2014/15
PIFS	\$53,775	\$320,000
Registration	\$20,000	\$32,000
Biosecurity fee	0	\$58,000
Total	\$73,775	\$410,000

Note1 - in light of changes across all Animal Health programs, the model used to calculate the cost detailed in the draft Livestock Bill 2011 will be reviewed late November 2011 and will result in costing changes.

Note2 – the ACIL Tasman report costs the apiary program at \$725,568. This includes an apportionment of all corporate overheads.

2.4 Apiary Industry in South Australia

The following tables compiled in a 2006-07 RIRDC national survey (Crooks 2008) show the total size of the apiary industry in Australia and also within each state. South Australia has approximately 7% of Australia's beekeepers, 12% of Australia's hives and produces 19% of Australia's honey. It would appear that South Australian apiarists generally keep more hives and produce more honey per hive than those in other States. Nationally, production per hive averages 51 kg of honey, while Southern Australian apiarists on average produced 96 kg of honey per hive, only exceeded by Western Australia at 105 kg. South Australian honey is generally valued by packers because of low levels of antibiotic residues, which is in-turn attributed to low disease levels.

Reproduced from Australian Honey Bee Industry Survey 2006-07

Numbers of beekeepers and hives, by state, 2006-07

State/territory	Number of beekeepers	% of beekeepers	Number of hives	% of hives	% operating 50 hives or more
New South Wales	3 062	31	236 233	41	22
<i>North</i>	1 623	16	120 252	21	23
<i>South</i>	1 439	15	115 981	20	21
Queensland	3 113	31	127 057	22	12
Western Australia	712	7	26 929	5	13
South Australia	724	7	67 344	12	27
Tasmania ^a	157	2	13 939	2	20
Victoria	2 143	22	99 261	17	16
Northern Territory ^a	7	0	1 205	0	na
Total	9 918	100	571 968	100	17

^aregistration is not compulsory in these states and as such the number of beekeepers is likely to be higher.

Source: state apiary offices

na: not available

Size of operations of Australian honeybee businesses, 2006-07

	Number of beekeepers	Average number of hives	Average honey sold per business (kg)	% of national honey sold
Tasmania	32	410	37 423	4
Southern NSW	300	367	25 399	23
South Australia	192	330	32 402	19
Northern NSW	364	319	14 499	16
Queensland	374	276	11 823	14
Victoria	338	262	16 485	17
Western Australia	95	236	25 068	7

Note – this table refers to apiarists managing at least 50 hives.

Pollination service provision, 2006-07

	Proportion of honeybee businesses providing pollination services (%)	Number of businesses providing pollination services	Number of businesses receiving payment for pollination services	Proportion of businesses receiving payment for pollination services (%)
South Australia	52	100	66	66
Tasmania	47	15	15	100
Victoria	39	132	132	100
Queensland	29	107	62	58
Western Australia	35	33	33	100
Southern NSW	26	78	51	65
Northern NSW	4	16	5	32
Total	28	481	363	76

The tables in attachment 3 show the current registration statistics in South Australia, as well as registration trends over the past 4 years. In September 2011 there were 847 registered apiarists and 49 unregistered apiarists, keeping a total over 63,000 hives. Fourteen percent (117) of registered apiarists were QA certified.

Registrations have increased by 130 over the past 4 years and this is believed to be a real increase in the number of beekeepers. Most of this increase has been in the smaller category of apiarist (1-50 hives), with the greatest proportion being people keeping 1-5 hives (that is hobbyists).

Honey is the main commercial output of the industry. Other products and services include the production of beeswax, queen bees, packaged bees and the provision of paid pollination services.

As reported in the RIRDC survey 22 per cent of South Australian apiarists used public land for honey production, compared with an estimated 66 per cent of honeybee businesses Australia wide. The relatively low level of public land usage in South Australia was attributed to limited availability of public land and favourable conditions for growing crops, such as lucerne. This could become a more important issue with time if use of paid pollination services increases. Apiarists need access to floral resources to build hive strength prior to pollination assignments.

The ABARE estimate of Gross Value of Production (GVP) for Australia was \$75 million in 2007-08, not counting pollination services; with SA producing 19% of honey sold in 2006-07 (RIRDC survey). Hence a derived estimate for GVP for the SA industry for 2007-08 is \$15 million. Cash receipts for pollination services were approximately \$569,000.

According to ABARE-BRS, the Australian industry produced \$90 million of honey and bees wax in 2009-10, giving a more current estimate for South Australia of \$17 million.

However the estimates of business cash receipts and costs from the 2006-07 RIRDC survey provide a slightly different picture. Figures were provided for 192 beekeepers who manage at least 50 hives (these apiarists account for 91 percent of all hives kept). Average cash receipts were \$103,700 per business giving a gross State figure of \$19.9 million. The average cash operating surplus was \$42,700 giving a total of \$8.2 million.

Apart from commercial products, it is generally acknowledged that honeybees and the honeybee industry (note, it could be argued that feral honeybees are not part of the industry) also play an essential role through the pollination of Australia's crops, both in terms of paid and unpaid pollination services. Various estimates are quoted regarding the value of pollination to Australia's agriculture. A study by Gordon & Davis (2003) for RIRDC reported that around 65 per cent of agricultural production in Australia depends on pollination by European honeybees and that pollination services to Australian horticulture and agriculture were valued at \$1.7 billion per annum in 1999-2000 for the 35 most important honeybee dependent crops.

According to an internal report by Coles & Willmott (2008), in 2006-2007 the value of production for pollination dependant horticultural crops in South Australia was estimated to be \$292m. The value for field crops, including lucerne seed, canola, fava beans and peas was estimated in 2006-2007 to be \$195m.

Many horticulture crops rely heavily on pollination from honeybees, with in some instances, almost total crop failure in the absence of honeybees as pollinators. Almonds are one such crop, and although all almond growers place bees in their orchards for pollination, it is likely that some growers use less than the recommended number of hives per hectare.

While a number of apple growers place hives in orchards, most rely on incidental pollination from wild honeybee populations. Most apple orchards in the Adelaide Hills have significant areas of native vegetation nearby that contain wild bees. Similarly, many citrus, stone fruit and vegetable growers also rely on incidental pollination from wild bees.

There does not seem to be good information readily available to producers on best practice for pollination services, for example the ideal number of hives per hectare. However a rate often quoted for a number of crops is 2-3 hives/ha. Industry advises that an average cost for paid pollination services is around \$75 / hive / flowering season.

The 2006-07 RIRDC survey indicated that the industry is faced with the challenge of meeting future demand for pollination services. Thirty- six per cent of honeybee businesses indicated they expect to begin or expand pollination services in the future. The main types of crops on which paid pollination services were used in 2006-07 were almonds, cherries, other fruit, pumpkins, apples, lucerne and canola.

A significant issue for the industry in terms of future apiarists is that the average age of owner/operators of Australian honeybee businesses is estimated to be around 58 years with an average of 35 years of experience in the honeybee industry (2006-07 survey). There is a perception that the average age may be lower in South Australia.

Also significant for South Australia, the *Apis mellifera ligustica* (Ligurian bees) on Kangaroo Island are believed to have minimal genetic out-crossing from the strain introduced in the 1800s. In recognition of their status, the South Australian Government declared Kangaroo Island a sanctuary to protect this unique honeybee gene pool. This has at the same time kept the population free from both American Foulbrood and European Foulbrood. There are 47 registered apiarists on Kangaroo Island. There is potential for the commercialisation of these genetics.

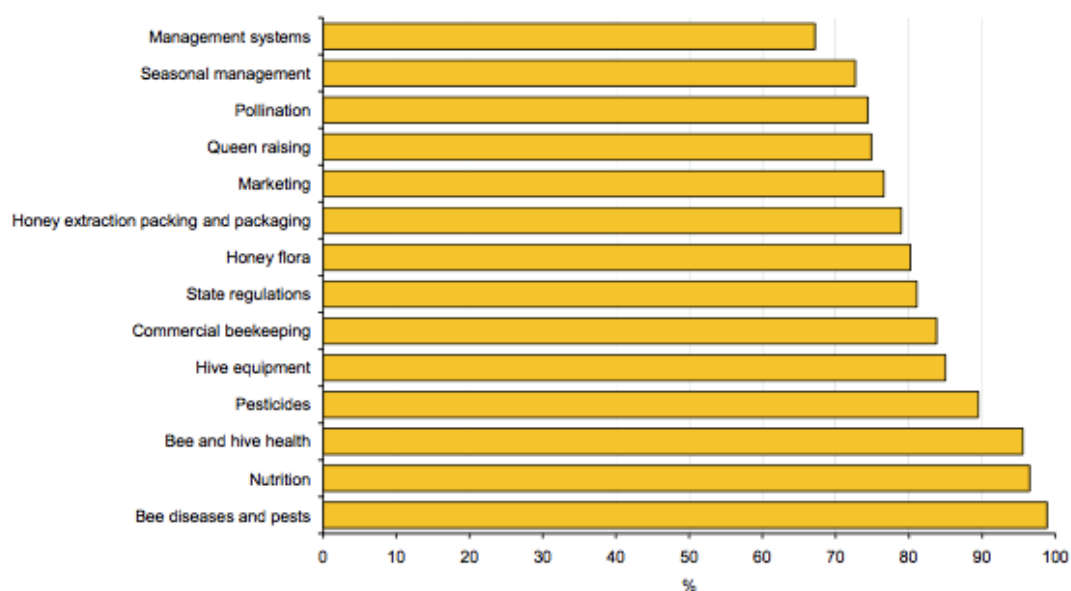
3. Biosecurity risks facing the apiary industry

The number of biosecurity incidents experienced by Australia has increased in recent years and this trend is likely to continue. One of the most predictable features of the “biosecurity environment” is its unpredictability in terms of the type of threat or incident that may happen next. There are many known threats, and many unknown threats as demonstrated in recent years with the appearance of a number of emerging pests and diseases. Some of the risk factors influencing this trend in relation to the apiary industry are provided in attachment 4.

The impact of pests and diseases remain a significant concern to Australian apiarists as indicated by the following graph reproduced from the 2006-07 RIRDC survey. It shows the importance of various categories of information to apiarists, with bee pests and diseases being most important.

Importance of information by topic, 2006-07

Proportion of honeybee businesses



There are a number of pests and diseases that are impacting or have the potential to impact on the apiary industry within South Australia and these may have economic, environmental or social impacts. The primary diseases of concern are:

3.1 Exotic threats

Varroa mite

The exotic parasitic Varroa mite is considered the most serious threat to the Australian apiary industry. The mite directly affects honey bees and also transmits other pathogens. There are a number of species and haplotypes, with the most significant being, *Varroa destructor* and *Varroa jacobsoni*. Although some recent work may cause some changed thinking, it is generally considered that *V jacobsoni* is primarily carried by the Asian Honey Bee, *Apis cerana* (with minimal impact), and that *V destructor* became adapted to European Honey Bees (*Apis mellifera*) around 50 years ago. Hence it is considered that introduced *A mellifera* are a greater threat of introducing Varroa into European bees than *A cerana*.

Varroa mite has been highly invasive on a global scale and Australia is the only continent in the world still free of this pest. *V destructor* originated in the Japan - Korea region in 1950. It spread to Russia during the 1950s and to Europe in the 1970s. In 1987, it was identified in the USA and in 1990 in South America followed by Africa in 1997 and New Zealand in 2000. In regions where the mite has become established, hived honey bee colonies have been severely affected, feral honey bees have been largely eliminated and managed honey bees have been unable to meet the demand for pollination services. In New Zealand feral bees virtually vanished from the North Island within four years of the invasion.

Varroa can be controlled by natural and synthetic chemical treatments, husbandry practices and by maintaining 'Varroa tolerant' strains. However, managing and monitoring hives increases beekeepers' costs, especially labour. New Zealand beekeepers have experienced increased costs of \$40 to \$50 per colony per year. Based on this, operating costs for an average-size Australian beekeeping operation could increase by around 30 per cent, more than halving the operating surplus for the average operation. It is likely that many small apiarists would cease to operate. There may be some offsets, as less competition from feral bees may lead to higher yields and there would be potentially higher returns from pollination services.

It is considered that an outbreak of Varroa will have a devastating impact on Australia's pollination-reliant industries. Much of the pollination service relied on by horticulturalists and agriculturalists is provided by feral bee colonies that will largely be eliminated by Varroa mites. Thus an incursion will not only impact on the honeybee industry but also on around 65% of horticultural crops produced.

Coles and Willmott (2008) calculated a rudimentary estimate of the maximum possible impact of Varroa in South Australia using 2006-07 data. The impact was estimated to be \$261 million per annum and they also estimated that over 400,000 hive assignments would be required for pollination services per annum, with a peak demand in August requiring 200,000 hives.

They also comment that while there may be a one to four year window before Varroa removes feral hives after being introduced to an area; managed hives will also be significantly impacted by the mite. They reason that apiarists managing hives for pollination and with a Varroa mite control program in place are likely to charge significantly more than currently, perhaps around \$120-150 per hive.

Tropilaelaps Mite

Tropilaelaps spp (there are four species), sometimes called the Asian bee mite, has been identified as the second most important threat to the viability of the Australian honey bee industry. The primary host of *Tropilaelaps* is the Giant Honey Bee (*Apis dorsata*) (and *A laboriosa*), which has been intercepted at Australian ports in the past, and is present to our near north. These mites are also known to be found on and vectored by *Apis cerana* and *Apis florea*.

Tropilaelaps, like Varroa, is a parasite that feeds on the blood of bee larvae and reproduces on bee brood. According to CSIRO, the impact of Asian bee mites establishing in Australia will be worse than Varroa, as they are able to multiply and kill European honey bee colonies much faster than the Varroa mite. However, the risk of entry of Asian bee mites is less than that of Varroa as they cannot live for long periods on adult bees (ie off the brood), the most likely vector for pests and diseases entering Australia. Bees can act as a short term vector, hence the risk of entry by air is greater than via a ship.

Tracheal Mite

Tracheal mites (*Acaparis woodi*) live in the airways of adult bees feeding on bee blood. Severe infestations reduce the life span of individual bees and cause the death of entire bee colonies. The mites do not appear to cause any significant losses during warmer periods of the year, but have been implicated in contributing up to 50% loss of colonies over winter. The principal effect of a tracheal mite incursion would be economic losses for beekeepers and the need to use chemicals to control infestations. The most likely vectors for an incursion are European or Asian honey bees arriving on a vessel at a port.

Exotic bees

There are a number of species of exotic bees that could impact on the apiary industry, either through introduction of exotic pests or other impacts such as competition for resources. The most significant are the Asian Honey Bee (AHB) (*Apis cerana*) and Giant Honey Bee (*Apis dorsata*).

There is currently an incursion of AHB around Cairns in Queensland that has been present since 2007. It is proving difficult to eradicate, and in fact, there has recently been a national decision that it is not eradicable. The risk of further new incursions is significant and introduced AHB infected with *Varroa* may go unnoticed for some time.

The experience to date in Cairns shows that AHB is highly invasive and modeling suggests that it has the potential to inhabit much of the Australian landscape.

Their preference for human habitation areas is likely to create significant public nuisance costs in the form of swarm removal and increased levels of stinging events. The impact of AHB on Australia's environment is also likely to be significant. AHB will be a significant competitor for nectar & pollen and they also occupy small cavities, displacing native birds and animals.

The impact on managed European Honey Bees is likely to be two-fold. They will be major competitors for nectar and pollen, thus reducing the honey crops produced by honeybees. Given the evidence gathered in the Solomon Islands, they are also likely to invade honeybee colonies to rob their stored honey during periods of low natural nectar supply.

Colony Collapse Disorder

Colony Collapse Disorder (CCD) is a relatively new disorder first noticed in the USA in 2006. A similar syndrome has now been reported in a number of European countries. It is characterized by a sudden loss of worker bees followed by rapid collapse and death of the colony and has been estimated to have wiped out up to a quarter of the US honey bee population.

The cause is not yet known, and several suspected causes are being investigated, including environmental stresses, malnutrition, combinations of pathogens (eg invertebrate iridescent viruses and *Nosema*), mites, pesticides and genetically modified crops. The cause is most likely multi-factorial. As the aetiology remains undetermined it is not possible to assess the level of threat posed to the bee keeping industry in Australia, hence a precautionary approach is warranted.

3.2 Endemic pests and diseases

American Foul Brood (AFB)

American Foul Brood is generally regarded as the most serious endemic disease of Australian bees. It is caused by a spore-forming bacterium, *Paenibacillus larvae var larvae*. The spores are highly resistant. Infection is spread through robbing, feeding unsterilised honey or pollen, using contaminated beekeeping equipment or contaminated bees drifting between hives. A significant issue with AFB is the spread of the disease between apiaries when they are transported to adjoining localities or sites.

The disease affects unsealed and sealed brood, with young larvae less than 24 hours old the most susceptible to the infection. Diseased larvae or pre-pupae are at first slightly yellow in colour. As decomposition advances they become coffee-coloured and extend lengthwise in the cells. On stirring with a match or similar probe, the contents of the cell may rope out forming a fine elastic thread up to 30 mm long. In the advanced stages, the brood pattern has a pepperbox appearance.

There are a number of control measures that can be adopted including burning infected bees and brood combs, equipment sterilisation (including gamma irradiation) and management practices to prevent further disease spread. Regular hive inspections are critical. Interestingly, in the 2006-07 RIRDC survey (Crooks 2008), very few commercial beekeepers reported that their production was affected by AFB. This is supported by comments to this reviewer from SA apiarists who stated that AFB is relatively easy to control using good management practices. Two significant issues associated with AFB control include the illegal use of antibiotics by less competent apiarists and resultant residue issues, and the ease with which infection can be picked up from infected apiaries in the vicinity.

AFB is subject to official control in all Australian States. Further information on the current situation in relation to AFB is presented in following sections.

European foulbrood

European foulbrood (EFB) is another brood disease of honeybees caused by the non-spore forming bacterium *Melissococcus pluton*. It can result in significantly reduced production. The disease is endemic throughout eastern Australia, but is not known to occur in Western Australia.

Larvae are most susceptible to infection when they are less than 48 hours old, and usually die while still in the coiled state. Poor nutrition and severe stress often cause this disease to break out. A secondary invading bacterium, *Bacillus alvei* is also commonly present. The disease is usually noticed in early spring, and to a lesser extent in autumn.

The disease can normally be managed through management practices such as improving hygiene and nutrition, requeening and reducing stress on hives. Antibiotics may also be prescribed legally, as opposed to their use for AFB. Unfortunately it would appear that some apiarists use antibiotics prescribed for EFB to control AFB.

EFB appears to have a relatively low prevalence in South Australia and there are no regulatory controls.

Chalkbrood

Chalkbrood was first identified in Australia in 1993 is caused by the fungus *Ascosphaera apis* and it affects both sealed and unsealed brood. It is characterized by fluffy, white fungal growth within the brood, with larvae later becoming hard, forming white or grey/black chalk-like “mummies”. Spores are highly infectious and are carried in contaminated pollen by infected foraging bees.

Maintaining strong healthy colonies has been demonstrated to reduce the effects of chalkbrood. There are no official controls.

Small Hive Beetle (SHB)

Small Hive Beetle (*Aethina tumida*) arrived in Australia in 2002 and has spread rapidly in New South Wales and Queensland, and is now present in Victoria. The impact of SHB can be significant, control can be very expensive, and the search for more effective solutions is subject to ongoing research. A new control device, Apithor has been on the market for around 4 months.

Feeding SHB larvae cause most of the damage to hives by consuming bee eggs, bee brood, pollen and honey; burrowing through combs and cappings, leaving them damaged; and contaminating honey with a yeast that causes the honey to ferment. Affected frames are said to be ‘slimed’.

It has been detected once in South Australia but at present is not considered endemic. However this is considered inevitable, given the movement of bee hives throughout Australia. Currently certification for freedom from SHB is required for entry into South Australia.

Nosema

Nosema apis, which causes nosema disease, is found worldwide and belongs to the Microspora group of organisms. *Nosema ceranae* was found in AHB (*Apis cerana*) in 1996. In 2005 it was found in *Apis mellifera* in Taiwan, and since then in Europe, North America and Australia.

N. apis is the most common cause of adult bee infection, and is regarded as a serious cause of economic loss in bees in Australia. There are no classic signs of the disease, so problems often go unnoticed. While most hives are infected, under the right conditions, unmanaged, heavy infections will cause reduced life span of bees, flightlessness, dysentery and reduced honey production. The disease is controlled through using sound management practices.

Wax moth

An estimated 70 per cent of honeybee businesses report the existence of wax moths (*Galleria mellonella* or *Achroia grisella*) in their stored honeycomb. This has an impact on production, although this is generally relatively minor, probably because wax moths invade only after a hive has been stored. There are a number of management techniques that can be used to control wax moth.

Sacbrood

Sacbrood is a viral disease that affects the brood of honeybees. It mostly occurs as a mild infection, which only kills a few larvae, but it can be more severe. Few hives die out as a direct result of sacbrood, but many are weakened to an extent where they succumb to other threats. It is controlled relatively easily through management methods to maintain colony fitness, such as re-queening infected colonies, regular brood comb replacement, improving nutrition and managing Nosema.

Other viruses

There are a number of other viruses that may infect bee colonies and their impacts are not well understood. However some are capable of affecting hive health if not managed using techniques as described for Sacbrood. One recent international study has suggested that CCD may be caused by a combination of invertebrate iridescent viruses and Nosema.

4. Current Biosecurity SA apiary program

The current Biosecurity SA apiary program is based on a combination of the goals of the South Australian Honeybee Industry Strategic Plan 2006-10 and an earlier Mandatory Disease Control Program.

The industry strategic plan has one goal relating to biosecurity:

- “Protect the SA beekeeping industry from pests and diseases”,
with a specific target - within 5 years less than:
- 9% of operations affected by AFB; and
 - 1% of hives.

There are 4 strategies:

1. Investigate mechanisms to more accurately measure the incidence of AFB.
2. Improve disease and pest surveillance and enforcement programs.
3. Work in partnership with AQIS and other Government agencies to control the entry of exotic pests to Australia
4. Educate beekeepers and the community.

The PIRSA Animal Health Business Plan 2008-2010 notes that control of endemic diseases (including AFB) and exotic disease surveillance are core deliverables. However Biosecurity SA currently does not have a documented project plan for its own apiary operations, with clear aims, objectives and deliverables, apart from what is documented on the Biosecurity SA website at:
http://www.pir.sa.gov.au/biosecuritysa/animalhealth/disease_control/bees

The Biosecurity SA website states that the program has two broad aims:

- Improve industry self-reliance and market access for apiary products by reducing the incidence of honey bee diseases, particularly American Foulbrood (AFB).
- Increase awareness within agricultural and horticultural industries about the effect of professional pollination services on crop yield and quality.

Broadly, the key elements of the program include:

- The formation of an industry advisory group, whose role will be to provide the Minister, after consultation with industry, with advice on industry funding, program direction, changes to legislation etc;
- Overseeing the results of a honey packer initiated AFB and residue testing program;
- Complementing the honey packer initiative with a targeted regulatory program focusing on the identification and "making safe" of neglected and abandoned material in areas reliant upon professional pollination services and known AFB infected apiary operations to eradicate AFB and prevent disease spread;
- Implementing targeted surveillance for antibiotic residues in known long term AFB infected operations and providing field support for the honey National Residue Survey program;
- Improving apiarist knowledge and skills in disease identification,

control and prevention through training and the implementation of risk management strategies;

- Annual registration, complemented by representative honey tests;
- Reviewing existing legislation;
- An extension campaign amongst agricultural and horticultural industries promoting the benefits of AFB free hives for pollination.

There is no internal documentation on how these strategies would be implemented, so details about current project activities were obtained by interviewing relevant officers. The legal authority for activities under the project are provided for within the *Livestock Act 1997*.

Currently there is one full-time and one part-time apiary officer working for Biosecurity SA (1.6 full time equivalents – FTEs). The part time officer is currently funded through revenue received from industry. These officers perform the majority of the direct apiary work (primarily field work). This represents a reduction from 2.5 FTEs several years ago. An estimated breakdown of their work time on various activities within the project is provided in the following table. Another officer spends 20 percent of her time on the apiary registration process. In addition, a number of officers devote small proportions of their time on related activities, such as compliance activities and policy work (0.36 FTEs). There is also a small amount of other animal health field staff time budgeted against apiary work to provide assistance where necessary, although this is rarely used.

Summary of activities for 1.6 FTE’s within the SA Apiary Program (Michael Stedman 1.0 FTE and Elizabeth Smee 0.6 FTE).

Activity	Full time equivalents
Registration: • managing process, forms, compliance follow-up	0.05
Planning & budgeting: • managing process, monitoring, forward estimates	0.04
AFB control: • inspections & advice • laboratory testing & follow-up • compliance & prosecutions • abandoned & neglected hives	0.7
Extension, advice & networking: • industry & public - incl. industry meetings, conferences • public nuisance bees & swarms • government bodies - federal, state & local • printed/web information - incl. factsheets	0.3
Reporting: • Ministerial’s & briefings	0.1
Certification: • industry - incl. health certificates, scripts	0.04
Surveillance - exotics: • sentinel hives/catch boxes - management & testing • industry program - management & testing	0.15
Emergency response preparedness: • internal • industry	0.03
Industry projects:	0.02

<ul style="list-style-type: none"> • NRS survey • nosema / virus survey • other 	
HISPIC/SA AIAG: <ul style="list-style-type: none"> • meetings • newsletters • transition 	0.15
Other: <ul style="list-style-type: none"> • training - incl. internal & external, updates, upgrades • equipment maintenance 	0.02
Total	1.6

HISPIC = Honeybee Industry Strategic Plan Implementation Committee
AIAG = Apiary Industry Advisory Group

In addition Chilali Peck does apiaries registration 0.2 FTE; Rob Rahaley spends 0.01 FTE on bees, Jack Van Wijk spends 0.05 FTE on bees and investigator, Kevin Glover spends approximately 0.3 FTE on bee related issues.

By way of comparison, there are 2.4 apiary officers in Victoria and 6 in NSW. Using apiary registration statistic for 2006-07, there is 1 apiary officer per 450 apiarists in SA, compared with 1:900 in Victoria and 1:500 in NSW. Note that this is a very crude measure and there may be significant differences in officers' duties.

The Biosecurity SA internal apiary budget for 2010-11 is provided in the following table. The variances between the total and that given in section 2.3 can be explained by differences in accounting methods. However the figures provide a good indication of where effort is expended.

	Budget
Disease Control	\$187,695
Animal Health Management	\$8,998
Communications & Training	\$5,082
Disease Surveillance	\$26,591
Field Staff	\$16,144
Compliance	\$81,589
Emergency Preparedness & Response ¹	
	\$326,099²

1 - Note that emergency response training is funded separately within Biosecurity SA. The full time apiary officer has received significant training under the generic AIIMS system that has been implemented with the business group.

2 – This total is probably an under-estimate of total expenditure on the apiary project.

Some general comments and observations relating to this analysis:

- Apiary officers generally feel that they have too much to do within the program, given available resources. They attempt to service all areas but the general feeling is that many areas do not receive sufficient attention. The senior apiary officer currently has an unreasonable accumulation of excess recreation leave.

- Despite the apparently reasonable apiary/officer ratio in SA compared with other states, 1.6 FTEs of specialist apiary officers is below the level required to deal with current apiary program work, let alone new and emerging issues. If the program was to be restructured, for example to abandon some current activities, the level of staffing is still marginal for that necessary to manage essential activities, as well as to maintain a capability to deal with new and emerging issues.
- By far the greatest effort is in the area of disease control (58% of budget and 44% of estimated effort). This primarily relates to AFB control. For comparison purposes, the overall animal health program figures are 31% and 23% respectively (ACIL Tasman report).
- It should be noted that the salary of one part time officer (0.6 FTE) is funded from the industry fund which is over sighted by industry (HISPIC). Currently, the industry priority is work on AFB. However industry also has the ability to change this priority.
- Associated laboratory work is performed by Gribbles and paid for from industry funds.
- There is current no specific effort devoted to analysis of data to monitor progress with AFB control. However indicative statistics were able to be obtained – see later analysis.
- Relatively small amounts of time are devoted to emergency response preparedness and to a lesser extent, structured surveillance. There is significant surveillance for new and exotic pests as a secondary outcome from AFB surveillance.
- Mr Stedman as program manager, devotes a significant proportion of his time to supporting the Honeybee Industry Strategic Plan Implementation Committee (HISPIC).

Comments and analysis relating to specific components of the program follow.

Apiary Registration

Currently all apiarists are required to be registered. An annual fee of \$22.20 to pay for administration applies, plus apiarists pay a voluntary \$1 per hive into the apiary industry fund under the *Primary Industry Funding Schemes Act 1998*. This process seems to work reasonably efficiently, although a number of apiarists do not contribute. However there were some aspects that received comment during consultation:

- More efficient, on-line processes for renewing and changing registration details would provide greater efficiency for both apiarists and the Department.
- Although brands are allocated to apiarists by the Chief Inspector of Stock and all hives must be branded, no registration code, similar to the property identification Code (PIC) used within the livestock industries, is allocated. Such a code has potential uses within the industry marketing chain and for traceability purposes.
- The registration fee does not cover the cost of administration. It is currently proposed that this will increase to around \$37 per annum.

Planning and Budgeting

As mentioned, while there is an industry strategic plan in existence, there is no equivalent plan for how Biosecurity SA will support the industry plan, or meet other government priorities. A simple program / project plan with aims, objectives and key deliverables would be desirable.

AFB Control (and other endemic diseases)

AFB, EFB and SHB are notifiable in South Australia. The biosecurity SA website states that apiarists must “Notify the Apiary Unit within 48 hours once a notifiable disease (particularly American Foulbrood) is detected within their hives”; and “Eradicate any notifiable disease from their apiaries”. There appears to be no further documentation on the website regarding apiarists responsibilities, apart from information on diagnosis and control within apiaries. However all registered apiarists are provided with hard copies of two documents: “South Australian Code of Practice for Apiculture Management” and “A manual for the Control of American Foulbrood”. These are not available on the website. Information is also provided to apiarists through occasional training days and extensive one on one management assistance for affected apiarists.

Reflecting the minimal impact of EFB in SA, EFB is managed primarily through provision diagnostic services, advice on control and occasional issuing of prescriptions for antibiotic treatments (the latter is mostly handled by private veterinarians).

AFB control is a very hands-on area of activity. Annual tests are mandatory for apiarists with more than 20 hives and they pay \$33.50 per test. The general view was that smaller apiarists who tend to not move their hives around tend to be a lower risk from an AFB perspective. The compliance rate with submitting samples is around 74%.

As part of AFB control, the inspectors' time is devoted to inspection of hives (targeted from honey test results, follow-up and random inspections); follow up advice following laboratory tests; compliance enforcement (abandoned / neglected hives, branding, exposed material, failure to notify, and failure to register). The surveillance done specifically for AFB is also useful for the broader surveillance components of the program.

Regarding direct action taken in relation to AFB, there is some contact with 200 plus apiarists per year, with around 100 apiary visits to provide advice or take other action (note - this also provides a significant level of general surveillance). The number of prosecutions and expiations (infringement notices) issued is quite low (3-4 per year).

The area of abandoned / neglected hives received considerable comment during the course of the review. This area receives attention because such apiaries tend to be a significant source of AFB infection for other apiarists. However the general feeling from industry was that too much apiary officers' time is devoted to this area (around 15-20 operations per year – 10% of one officer's time) and that a more efficient compliance method is required.

Regarding the results of AFB control efforts, the following data was obtained from within laboratory records and field inspections. While it is difficult to derive prevalence figures from this data, it indicates that the AFB situation is relatively stable. The general view was that the prevalence is around 15-20% of apiaries.

Diagnoses by No. Gribbles Laboratory Submissions for Apiaries

Year	Paenibacillus larvae (AFB)					Total
	Confirmed	No Diagnosis	Not Detected	Pending	Suspect	
2007 – 2008	33	0	231	3	14	281
2008 - 2009	28	0	135	9	15	187
2009 - 2010	25	1	218	3	37	284
2010 - 2011	25	1	199	7	25	257
Total	111	2	783	22	91	1,009

Apiarists who have had honey tested for AFB from 01/03/2011 to 20/09/2011

No. Hives Category	No. Operations	No. Samples	Highest AFB result				AFB Apparent Prevalence
			0	1+	2+	3+	
			No. Ops	No. Ops	No. Ops	No. Ops	
1 - 19	3	3	3	0	0	0	0%
20 - 49	49	51	45	4	1	0	10%
50 - 99	28	32	25	2	0	1	10%
100 - 499	76	104	67	13	0	1	18%
500 - 999	12	25	10	4	0	0	33%
1000+	3	4	3	0	0	0	0%
Total	171	219	153	23	1	2	14%

Results of field inspections for AFB

Year	Hives inspected	Number infected
2006	3790	117
2008	7200	500
2009	8905	755
2010	8000 (approx)	500

Notes: There is no data for 2007 owing to resources diverted to the equine influenza response.

The increase in inspection from 2008 is related to employment of an additional, part-time inspector.

Extension, advice and networking

This is an area that is considered important by the industry and given the industry structure, it is not surprising that it represents a considerable portion of apiary officers' time. Newsletters are produced at least 4 times per year by Biosecurity SA and are sent to all registered apiarists.

There were a number of suggestions during consultation regarding how this area could be improved and these will be covered in section 6. However an observation from the reviewer is that the Biosecurity SA website pertaining to this area requires some improvement in relation to both content and ease of accessing information.

Advice regarding management of swarms and nuisance bee complaints takes up a considerable proportion of the workload. These are primarily local government responsibilities, but often Council officers don't have the necessary skills. While this area of work should be minimised as much as possible, it is probably a community service obligation that can't be entirely avoided.

One of the apiary officers also undertakes a small number of Quality Assurance (QA) audits and provides QA advice, at no charge. While the latter may well be valuable work, it is difficult to justify provision of QA audits.

Reporting

This is a necessary area of work, although the reviewer was surprised to see an apiary field officer (also undertaking the role of Program Manager) spending significant time on Ministerial replies and briefings. This is less than ideal from an efficiency perspective, but maybe a necessity in a smaller State with lower numbers of dedicated policy officers.

Certification

This area relates primarily to issuing of interstate health certificates, but also includes writing of prescriptions for EFB treatments. The latter is not a big area as most are written by private veterinarians. However, in principle, it is debatable whether it is an appropriate government function.

Regarding interstate health certificates, given the mobile nature of the apiary industry, the fact that the diseases referred to on the form are all endemic and there is limited compliance monitoring, there is debate regarding the effectiveness of this disease control mechanism. The form requires certification by an apiary officer and in some circumstances, inspection of the apiary. However, given that the form is national, it is most appropriate that this issue be debated in national forums.

Given that SHB is not known to be endemic in South Australia, special certification is currently required for entry from other states. While there were some questions regarding the effectiveness of this certification, the process appears to be prudent to slow the inevitable spread of SHB into SA.

Surveillance

This area of activity relates primarily to surveillance for exotic pests and diseases. It involves passive surveillance (investigation of disease reports) and active surveillance. The latter involves maintenance of sentinel hives at 3 Ports and catch boxes at 10 container depots. Adelaide airport is considered the biggest risk and there have been 4 detections of *A dorsata* in the last three years. There have also been 2 *A cerana* detections at Port Adelaide in the past 15 years.

Indications are that the level of passive surveillance or reporting by apiarists is relatively poor and requires more education of beekeepers. Similarly, active surveillance could also be improved. Suggestions are made later in this report regarding how to make improvements in this area. Advice from DAFF is that funding for the sentinel hive program is finishing and that a new program with a broader focus is being developed at the national level in consultation with industry.

Emergency response preparedness

While generic emergency response training is provided for all Biosecurity SA staff, for the apiary industry specifically, this is an area that seems to have dropped off in the face of other priorities. For example in previous years industry training workshops have been conducted, but this has not occurred for some time. Similarly, training (and support) of livestock officers in basic bee skills has also dropped off.

Industry projects

This is a small but important area of work to address new and emerging issues. Activity in any year depends on current priorities and specific project funding.

Support for industry advisory groups (HISPIC / AIAG)

This is an important area of work, but currently is taking up a significant amount of apiary officer time, largely owing to difficulties in retaining people with an industry/government funded executive officer position. Similar comments as made under "reporting" apply.

Other

The items listed are necessary to maintain routine operations.

5. Overview of apiary programs in other States

Most states in Australia have similar apiary programs, with some regional variations:

- Registration is mandatory in all States except Tasmania (hives must be identified and most are registered on a voluntary basis) and Northern Territory.
- Tasmania has a Protected Area for an apparently pure strain of *Apis mellifera mellifera* (Black Bees).
- Also in Tasmania, the approach to control of Chalkbrood, EFB and AFB is through establishment of Industry Control Programs with an industry management committee, rather than more traditional regulatory programs. Tasmania has a more seasonal honey flow and can treat with antibiotics during winter months without creating residue concerns, hence there is less justification for regulating control of AFB.
- Western Australia is free from EHB and SHB (it has had an outbreak of the latter in the Kimberleys), and imposes strict movement requirements on entry of bees from the eastern States.
- The Northern Territory has 6 commercial beekeepers and 16 hobbyists. A survey conducted in 2009/10 demonstrated the absence of SHB, AFB and EFB.

Some comments related to the main Eastern States' apiary programs follow.

Victoria

There has been a significant AFB control program over the past 10 years jointly funded by government and industry. However recently the Minister has suspended the program pending advice from industry in light of the Victorian Biosecurity Strategy and the fact that it is an endemic disease. The intention is for government to concentrate more on provision of information, surveillance and preparedness, especially in relation to Varroa. Honey testing is now paid for by apiarists and still encouraged. The infection rate in apiaries was not able to be supplied and may increase with less government intervention putting greater disease pressure on the SA industry.

SHB has spread fairly widely in Victoria but appears to be causing minimal damage. Infestations are likely to be fairly close to the South Australian border.

Regarding pollination services within Victoria, 40% are supplied by Victorian apiarists, with the rest coming from interstate, thus demonstrating the nomadic nature of the industry.

Regarding staffing, Victoria has 2.4 apiary inspectors, plus another part time officer who works primarily on policy. Some other field staff also have apiary skills for use when required.

Victoria has also established and maintains a 60 strong State Quarantine Response Team (SQRT) comprising hobby, sideline and commercial beekeepers from throughout Victoria. They have volunteered to be members of SQRT with an understanding that they will receive ongoing training / refresher training and will be employed by DPI Victoria to conduct in-hive surveillance under supervision of a stock inspector for Varroa (or any other bee exotic pest). Members can decide not to respond to a call-up if it is not convenient to do so, hence the relatively large team to allow for this and for staggered call-ups. There has been no consideration of use of these teams across State borders, but this is not out of the question.

Victoria also have beekeepers involved in their exotic disease surveillance program. In addition to 3 sentinel hive sites and 30 catch boxes, 90 beekeepers, primarily around Ports are supported to perform regular sugarshake testing for Varroa.

NSW

AFB is estimated to be present in up to 30% of apiaries. The NSW apiary industry would like to see increased regulatory investment into AFB. However, this is not in line with the Department's general policy position for endemic diseases with no human health or environmental effects, where the beneficiary is a single industry. The Department is working to have industry take primary responsibility for AFB. Both the Department and industry agree that the current compensation levy for AFB (whereby beekeepers pay 30 cents per hive and can claim compensation for infected hives) has not been successful and repeal of the relevant *Apiaries Regulation 2005* is currently scheduled to come into effect on 1 September 2012.

Currently, regulation of the apiary industry is estimated to cost about 4 FTE in staff wages plus some operational costs, estimated at approx \$540,000. A significant proportion of this is investigating nuisance bee complaints plus interstate certification. There is also an un-quantified cost of policy and legislation people backing up the NSW apiary program. NSW laboratories also provide diagnostics for AFB (larval smears and honey testing) at no cost to registered beekeepers.

NSW DPI also has a full time technical specialist for bees and a full time livestock officer for bees. They have been running a very successful 'pests and diseases of honeybees' 2 day courses for which beekeepers pay \$480 and claim it back through the Commonwealth's FarmReady program.

Queensland

A major focus of the Queensland program currently is eradication of Asian Honey Bee (AHB) from the Cairns region. This is funded nationally and separate to the normal apiary project.

Apart from AHB staff, there are one full time and two part time specialist apiary officers employed by Biosecurity Queensland. There is also a policy officer who works part-time on apiary issues.

There has been a significant disinvestment in AFB control. While honey testing is encouraged, it is not mandatory. The disease is notifiable, but apiary officers primarily become involved when requested by apiarists who are experiencing problems with managing the disease. Action is also taken against problem neglected / abandoned hives. Regulatory action may also be taken if an AFB infected apiary is causing problems for a neighbouring apiary.

The feeling is that AFB prevalence is increasing and many apiarists are struggling with managing the disease. This is leading to increased illegal use of antibiotics.

There is currently a strong focus on industry education through monthly information sessions that concentrate on exotic disease diagnosis and endemic disease management.

SHB is a major problem and has forced many smaller apiarists out of the industry. It is a bigger problem in wetter years. A recent survey estimated that it is costing the Queensland industry \$2m per annum in lost production and management costs. There have also been problems with inappropriate chemical use. There is now a

product, Apithor (a fipronil impregnated harbourage), registered for use and it appears to be reasonably effective. Cost is \$5 per device and they cannot be recharged.

Regarding surveillance for exotic pests, there is education as mentioned, Port surveillance and active industry surveillance – collection packs are sent to around 30 apiarists twice per year.

6. Results of Consultation Conducted

In this section a summary of key issues discussed or raised during consultation sessions is provided.

Biosecurity SA Executive

- A key driver and non-negotiable is the government decision to implement cost recovery for Biosecurity SA animal health programs.
- A key report that informs implementation is the ACIL Tasman report that costs the apiary program at \$725,568, taking into account all corporate costs.
- This report doesn't recommend an appropriate cost recovery mechanism for the apiary industry. There are concerns that, given the size and profitability of apiary enterprises, they may not be able to pay the proposed biosecurity fee and / or an increased hive levy. Hence, alternative industry funding mechanisms need to be investigated.
- Regarding a future program, national Biosecurity obligations take highest priority.
- What are the exotic disease risks and what is an appropriate level of surveillance?
- There are concerns regarding the level of investment in surveillance and emergency preparedness and whether government responsibilities are being met.
- Any work conducted on endemic diseases is discretionary.
- Questions were raised regarding what should be the role of government for an endemic disease like AFB, as well as other industry development type activities not strictly related to Biosecurity. The unique problems with controlling AFB were acknowledged, in that apiarists don't have much (if any) control over other apiarists with nearby hives and hence have limited ability to prevent infection being introduced.
- Questions were raised about the efficiency of allocating apiary officers' time to managing (including disposing of) neglected / abandoned hives.
- Are expiations utilised enough and can their use be expanded?
- Concerns were raised about reducing the number of apiary staff further, given the need to maintain a critical mass of expertise/capability.
- Regarding government mandated QA programs, this was seen as difficult to justify from a government policy perspective.

Apiary Program Staff

Much of the information supplied has been incorporated into previous sections. Additional issues raised include:

- The group of apiarists that present the biggest disease risk are the medium sized apiarists (50-300 hives) who often operate their business on weekends. Apiarists generally need greater than 600 hives to be commercially successful.
- Questions were raised over the biosecurity risk of imported honey being imported into South Australia by packers and whether this should be targeted for surveillance.
- Critical mass of specialist staff, as well as succession planning, was seen to be a very significant issue.

- Concerns were raised about the cash flow into and out of the industry fund, which has seen a drop in cash balance from \$226k down to a projected \$113k by the end of 2012.
- Questions were raised about the industry attitude to contributing to the fund if expenditure on AFB was reduced. It was pointed out that some producers already have stopped contributing.
- Officers were concerned about the economic impacts on industry if AFB control were to be relaxed.
- There is the potential to increase the use of expiations for some offences. However the monies received would not be returned to the program (revenues from fines are absorbed into consolidated revenue), and it was thought that greater emphasis on education would be more effective in terms of outcomes.
- There is the potential to rely more on Orders on apiarists to clean up their operations, provided follow up inspections can be done.
- There are regional differences in attitudes to AFB control, particularly as hive densities are significantly higher in the South East and the Riverland, with a lot of out of area apiarists moving in during honey flows and / or pollination, compared with other areas of the state.
- There has been a problem regarding the willingness of consultants and auditors to report AFB findings, despite their legal responsibility to report.
- For compliance staff the busiest time is during May-June when unregistered apiarists and those who have not submitted honey samples are followed up. Currently no action taken against those with less than 10 hives – for resource reasons and also considered lower risk (at the time of the consultation there were 46 apiarists with less than ten hives not registered). There is currently no specific compliance policy to cover this.
- Currently failure to register must be handled as a prosecution (14 briefs currently in the system). However it is expected that expiations will soon be able to be used (already used for failure to supply honey sample – 23 this year since June).
- Also conduct other investigations, for example recent SHB introduction and some neglected/abandoned hive situations.
- Failure to notify and exposed material also generally handled as expiations.
- Apiary issues consume 90% of time of single investigator in Biosecurity SA in May-June period and 5-10% of time for the rest of the year – overall around 0.3 FTE (note - the compliance officer was originally employed specifically to address the apiaries issue and part funded by industry).
- Suggested that compliance with registrations would improve if there were exemptions to the new fees for smaller apiarists or those that don't sell honey.
- Abandoned hives – unfair on owner to pay for clean-up if owner of hives is not known.
- SA Food safety legislation currently doesn't cover honey. This is the only legislation that mandates QA programs.
- A 2002 Report, "Food Safety Risk Profile for Primary Industries in South Australia" included honey and identified two risks (1) botulinum spores as a risk to infants under 12 months of age and (2) antibiotics and other residues. It recommended that both issues be addressed through education.

Department of Agriculture Fisheries and Forestry (DAFF)

- DAFF is primarily concerned with border controls and management of responses under the Emergency Plant pest Response Deed (EPPRD). Responsibility for the latter has recently transferred to the Office of the Chief Plant protection Officer, although there is an officer with apiary industry expertise remaining within the Office of the Chief Veterinary Officer.

- Priorities at a State level include the importance of early reporting and collaboration on the Port surveillance program – currently being reviewed. Management of emergency agvet chemical permits in the face of an emergency response is also seen as a priority.
- The Port surveillance program is currently under review and it is considered that surveillance techniques generally should be broadened. The Victoria Bforce program using backyard apiarists around the Port of Melbourne was given as a good example. However, the best surveillance methods are still being debated, considering that once Varroa mites are seen in apiaries it is probably too late to attempt eradication.
- Reporting from SA to the Commonwealth on surveillance data could be improved.
- Regarding endemic disease management, for example AFB, the view is that this should largely be an owner responsibility.
- It was pointed out that a large proportion of apiarists service almond orchards every August and this presents a big opportunity for disease spread. There is little State authorities could do about this.

Honeybee Industry Strategic Plan Implementation Committee (HISPIC)

HISPIC is the primary industry advisory group to the South Australian government on honeybee industry issues.

- HISPIC is very keen for quality assurance (QA) programs to be adopted within the industry to manage a range of issues, including disease control.
- HISPIC has proposed that it should be a registration requirement that all apiaries with more than 50 hives must be QA accredited (there are a number of QA programs available to apiarists, including B-Qual, NASSA, Sci Qual and B-Safe). Now is a good time for this to be included given that the Livestock Act is being reviewed.
- It was also suggested that all beekeepers should attend a two day apiary training course before being allowed to register.
- The general intent is a move towards a greater level of self regulation, so the overall standard and image of the industry is improved. However it was acknowledged that progress may be slow and needs to be staged.
- It was indicated that half of the approximately 200 beekeepers in SA with greater than 50 hives have made some steps towards QA accreditation.
- It was acknowledged that management of non compliance would be a problem and that there was still a need for a regulatory “hook” to encourage compliance.
- Regarding the role of packers, it was considered desirable that QA become mandatory for supply of honey.
- HISPIC also raised the issue of semi-commercial apiarists with 50-150 hives present the biggest challenge in relation to standards of management.
- Regarding pollination services it was pointed out that the almond industry is growing rapidly and that there would likely be market failure following an outbreak of Varroa.
- The desirability of QA for pollinators was also raised, and it was indicated that some receivers of pollination services already ask for proof of AFB control.
- Regarding receivers of pollination paying for apiary services, it was considered that this would not happen directly, but there should be an indirect contribution by passing costs on via fees charged.
- Members also questioned the need for health certificates to be required for honey that is moved interstate.

- Regarding the overall direction of the government apiary program, it was considered that the industry should be moving to manage endemic diseases, with government looking after surveillance and preparedness for exotics. It was also considered important for government to ensure laboratory backup. Certification should be fee for service, self certification or in some cases abandoned.
- Costs for managing abandoned / neglected hives should be borne by the owner. Simplified processes were encouraged, for example the ability for a farmer to send a photo to an apiary officer together with relevant details and receive an order to destroy the hives.
- Other efficiency measures such as electronic communications and automated systems were also suggested.
- Regarding mechanisms for greater industry contribution to the apiary program, suggestions included more direct cost recovery for services, increased expiations, increasing registration fees. Increasing the \$1 per hive voluntary contribution to the industry fund was seen to be problematical.
- It was there is a critical mass issue in relation to the current level of staffing and that utilisation of industry people (eg ILO's) needs to be revitalised (22 people were trained in the last training exercise at a cost of \$10k).

South Australia Apiarists Association

- AFB control is still important for the industry for production reasons, as well as maintaining a competent level of biosecurity and preparedness at the apiary level with a view to future exotic pest outbreaks.
- Increasing the PIFS hive levy is likely to see a significant number of apiarists opt-out. This would depend to some extent on what the industry sees it is getting in return. Reducing resources into AFB control will be seen as less service.
- The industry strongly supports a mandatory requirement for QA at the apiary level. While the discussion was generally about a government mandate, it was also agreed that this could be driven by the packers, if there was national agreement for them to do so. It was also supported that receivers of pollination services should request QA.
- SAAA considers that Biosecurity SA should maintain at least 2 full time apiary officers.
- Maintenance of Port surveillance is important and use of amateur apiarists for surveillance in the city should be introduced.
- Reporting of honey test results should be streamlined and more timely.
- Health certificates should not be required if the apiarist is QA accredited, especially for cross border movement of honey.
- All levies should be mandatory.
- It should be the responsibility of packers to take honey samples for testing.
- The cost of cleaning up abandoned / neglected hives should be borne by the owner of the hives, not the landowner. The latter would lead to under-reporting and removal of sites.
- Prosecution should be mandatory on the second offence, for example neglected hives or serious AFB cases that have not been managed. De-registration should be considered.
- There should be the ability to remove an apiarist's right to keep bees (equivalent to losing licence to operate).
- On the spot fines should be used more often.
- There should be a greater emphasis on preparedness for exotic pests and diseases.
- SAAA supports mandatory pre-entry training for apiarists (mandatory licensing).
- Fee for service should be repaid with good service for the fee.

- There should be better reporting to industry by Biosecurity SA.
- Neighbouring beekeepers should be notified electronically when there is a diagnosis of serious / problem AFB in their district.
- A web based registration system should be introduced that provides the ability for apiarists to notify hive locations to facilitate the above process.
- The Code of Practice should be mandated by regulation or included within QA programs. The Code of Practice should also be updated.
- Supports the use of national R&D funds to progress some of these issues – which are of importance nationally, not just in SA.
- There was some discussion of whether the Strategic Plan targets for AFB were realistic.
- Supported the establishment of a system where industry members could offer to assist other apiarists to manage problem situations within their apiaries. This could be maintained by SAAA.

Bee Society of South Australia

This group is made up primarily of amateur beekeepers. It has 150 members who keep on average 2-3 hives.

- The first issue raised was a lack of visible service provided for the fees that are levied. It appears that minimal apiary officers' time is devoted to services to amateur apiarists.
- Concerns were raised regarding the time taken to receive honey test results for AFB, with up to 6 weeks taken. Note that this was followed up and I was advised that test results are normally returned within a week and the instance cited was a one-off case due to extenuating circumstances.
- Use of the commercially available (Vita) "Honeybee Foulbrood Test Kit" was suggested so that apiarists could more quickly respond to infected hives. The sensitivity and specificity of this test kit is not known, but warrants further investigation. It was also suggested that these kits could be purchased in bulk to reduce the cost (\$20+).
- Amateur apiarists don't generally see AFB as a big problem. This is supported by comments from apiary officers. Their hives are moved less and therefore expose to infected hives less.
- More significant concerns are Varroa mites and small hive beetle. Regarding the latter, the Society has concerns about interstate movements and the quality of associated certification.
- Other priorities include better education and extension; improving the quality of information and accessibility of the Biosecurity SA web site; on-line registration and on-line permits.
- It was also considered that a registration number should be issued that could be included on relevant forms.
- There was support for a form of QA to be developed for small apiarists that would be based on peer assessment.
- The Society sees itself as the "breeding ground" for future commercial apiarists and hence is keen to play a key role in education. The main impediment to this happening is a lack of a dedicated facility for storing equipment, keeping demonstration hives and conducting training / education activities.
- To this end the Society asked whether the SA government may have some suitable land that could be used for this purpose. Note – later discussion with the Executive did not dismiss this idea and a couple of possible sites were suggested.

Group of Independent Apiarists

This was a small group of independent apiarists that requested a separate meeting.

- Generally this group advocated greater self management by industry, supported by education and innovations such as use of the self test, Vita kits already mentioned.
- Questions were raised about the apparent benefits versus cost of the current Biosecurity SA apiary program.
- Concerns were raised about greater levels of cost recovery, but greater individual responsibility was supported, for example third party providers to clean up neglected operations, at the beekeepers expense.
- Abandoned hives – should be the responsibility of the property owner to clean up.
- Experienced apiarists consider AFB relatively easy to control. The primary focus should be education on good management, testing and feedback. The latter should be done through packers.
- The value of pollination is under-recognised.
- A greater R&D capability is required within SARDI.
- It was suggested that registrations could occur through local government.
- It was agreed that within the apiary program, greater emphasis should be placed on prevention, surveillance preparedness and provision of information. This should include a system for getting information out quickly to industry in the face of an outbreak. Automated systems were also supported.
- Introduction of a PIC system as used in the livestock industries for tracing purposes and mandatory or voluntary recording of apiary sites were also suggested. However the cost of the latter was questioned.
- It was suggested that there should be mandatory education for new apiarists.
- Accelerated introduction of QA through the industry was supported, but not considered to be a government role. It was acknowledged that packers are already paying a premium for honey supplied under a QA program. Mandatory QA as a requirement of registration was not supported.
- It was suggested that there is a need for an industry risk assessment of exotic diseases and a review of their categorization under the EPPRD.

Australian Honey Bee Industry Council (AHBIC)

- Sees the issue of AFB control as a difficult one for industry to resolve. AFB is important because (a) it leads to use of antibiotics and consequent residues in honey and (b) because of the limited ability of apiarists to protect themselves from infection from a nearby infected apiary. Despite its use being illegal, oxytetracycline antibiotic is used by some apiarists to reduce management costs.
- Control of AFB and antibiotic residues is included in B-Qual and other QA programs.
- Considers that AFB control is best handled through uptake of on-farm biosecurity by apiarists supported by universal uptake of QA, together with third party auditing.
- If not in a QA program, apiarists should be audited by the Department at full cost.
- Supports increased use of expiations (on the spot fines) for non-compliance.
- Proposes that all States introduce a \$50 per apiarist biosecurity fee that would go into a national fund to address national biosecurity issues.
- Agrees that surveillance and exotic disease preparedness should be a high priority.
- Is concerned about the potential market access implications of pyrrolizidine alkaloid residues.

- Is not particularly concerned about honey imports as these are currently declining.
- Was interested to know which agency is responsible for food safety at farmers markets and whether any auditing / checking is happening in SA.
- There has been limited progress in designing a new national surveillance program and this is a frustration for industry.

Plant Health Australia (PHA)

- PHA has relatively recently assumed responsibility for honeybee issues under the EPPRD and is still developing its expertise in this area. A new specialist officer has recently been appointed. The initial priority has been DEED training with industry and some Industry Liaison Officer training (more specific emergency response training is seen as a state responsibility).
- PHA is currently looking at the requirements for a more comprehensive national surveillance program in consultation with stakeholders. However, it is unlikely that there will be sufficient resources to implement all elements of the national program.
- Currently the sentinel hive program is operating on a “business as usual” basis using funds transferred from Animal Health Australia. It was noted that some states, including SA, are often tardy in submitting invoices for work performed and thus may miss out on this funding.
- One issue is that the national levy is only derived from honey production and not pollination. Hence in the case of a response, provisions for owner reimbursement do not cover some aspects of the industry like pollination.
- Regarding quality assurance within the industry, this is seen broadly as an industry management issue, preferably driven by the end user. However currently there are no strong drivers for QA, which places pressure on government to introduce mandatory provisions.
- PHA is currently producing a hive biosecurity manual and an on-line training package on biosecurity for the bee industry. These will support introduction of QA concepts to the industry.
- PHA does not have a significant role in AFB control, apart from using good AFB control practices as an example for on-farm biosecurity.
- Generally agrees that there should be greater emphasis on exotic disease surveillance and preparedness rather than the current emphasis on endemic disease control.
- However, it is also recognised that good AFB control practices will help with recognition and control of all diseases, including exotics. Hence, would like to see more linkages made between endemic disease work at the state level and exotic disease surveillance.
- Regarding surveillance programs that utilise apiarists, for example the Victorian program, the point was made that these are often initiated with excellent cooperation. The challenge is maintaining this over time, which requires ongoing incentives, funding and community engagement. Investigation of cross-border sharing of the management of these programs is supported.

Apple and Pear Growers Association

- Approximately 50% of members use pollination services. Growers in areas such as the Adelaide Hills benefit from a high feral bee population.
- Use of managed bees is generally not seen as critical but more as insurance. Many varieties although supposed to be self-fertilizing still benefit from bees.

- Bumblebees are good pollinators for apples and pears but their introduction is not supported.
- There is an increasing usage of nets over crops, which will increase the need for pollination services as feral bees tend to avoid areas under nets. Production is noticeably lower towards the centre of the netted area.
- Generally can see the demand for bees increasing over time.
- Paid pollinators are used at approximately 2 hives / ha with an average charge of \$75 per hive.
- Little documented work has been done on production benefits.
- The industry is aware of the potential impacts from Varroa mite and sees that this would lead to an increased cost of pollination services and may impede the free movement of bees.
- The industry is not particularly concerned with AFB.
- Regarding industry contribution to the apiary program, the view is that those apiarists directly affected should pay and that these costs would be passed onto end users via fees.
- Margins are thin and the industry envisages it may have to contribute to programs directly affecting them, such as fruit fly control.

Cherry Growers Association

- The South Australian industry consists of 120 growers, 50 of which are members of the association. The industry produces 20% of the national crop, 95% in the Adelaide Hills.
- Use of pollination services is variable depending on the level of surrounding bushland. Where used, they are placed on a grid at intervals of 150m or less. Cost is around \$75 per hive.
- Cherries are not a good feed source for bees, so supplementary feeding is required.
- The industry is concerned about the impact of a Varroa mite incursion, so this is the industry's primary bee health concern.
- Regarding funding of the apiary program, this could be achieved through a broadly based levy across beneficiary industries. However, industry would expect to see results from this investment.

Lucerne Australia

- The vast majority of lucerne growers use pollination services, with around 50% being paid services.
- Agrees that the general direction of the program should be increased emphasis on surveillance and preparedness.
- There is no agenda within the industry to require pollination service providers to have QA programs. However, there is also a lower ability to pay and the returns to pollination providers are lower than for other industries.
- There is no interest within industry to contribute funds towards the apiary program. However it is expected that increased apiarist costs would be passed on.

Almond Board of Australia

- Biggest priorities from a pest and disease perspective are exotic incursions such as Varroa mite.
- Access to sites across State borders is important, for example Lindsay Point in Victoria can only be easily accessed by apiarists via South Australia.
- Active member of Pollination Advisory Committee of RIRDC, with significant R&D contribution. Would like to see more state government investment in R&D.
- Industry has no current intention to impose QA programs on apiarists, this would be a commercial decision made by the orchards. Industry may look to encourage it. However 80-90% of growers have a formal arrangement or contract with apiarist that includes minimum standards, particularly in relation to hive strength.
- Varroa mite is listed in its PHA Orchard Biosecurity Manual as a high priority pest of pollination. Would consider contributing funds to a Varroa response in the case of an incursion. Largely believes surveillance and emergency preparedness is a government role and endemic pest management is to be funded by the direct industries involved. However, does believe the almond industry would contribute to parts of the program indirectly through its hive rental costs.
- Would like to investigate more generally a national funding mechanism to capture all pollination users and help fund exotic honeybee pest incursions. This should be arranged in “peace time” before an incursion occurs and based on a user pays system, and should not replace or subsidise the current honeybee mechanisms.
- Another important issue is the need to maintain a critical mass of specialist apiary staff.

Spring Gully Packers, Adelaide

This is the largest honey packer based in SA (the greatest volume of honey production from SA goes to Capilano in Brisbane).

- AFB is an issue from a production and antibiotic residues perspective. Production in SA has been depressed for the past 8 years due to drought but is now recovering.
- Currently collects a significant number of honey samples for AFB testing (satisfies regulatory requirement for 1 sample per year, but aims for 2 samples per year per apiary) and coordinates reporting of results with Biosecurity SA. However, made the comment that the process could be more efficient, in terms of a streamlined process to assist the beekeeper in managing AFB. Apiarists should be able to quickly and easily get rid of AFB with early detection & reporting, which would lead to less need for “burn outs”.
- Commented that is unaware of what is in place to deal with exotic threats and agrees that there should be more investment in this area. Particularly would like to see more reporting.
- Regarding QA, Spring Gully is very keen for this to be adopted through the supply chain and has systems in place to encourage uptake. No particular system is insisted upon. They have a person available to do auditing if the apiarist is not using B-Qual. The system must be HACCP based and 3rd party audited.
- There is currently no biosecurity element included, with the emphasis being on food quality and residues.
- This is seen as a simple, start up system. It is anticipated that a major driver in the future will be an insistence from Coles and Woolworths for QA for their generic brands (these lines are being increasingly marketed). On the contrary, there appears to be no QA driver for honey sold through farmers markets.

- They now pay a premium for honey from QA accredited apiarists (or a discount for those not accredited).
- The intention is that all suppliers must be accredited in the future – date not fixed, but probably by June 2012.
- To support uptake, Spring Gully hosts mini-conferences for suppliers.
- The view expressed was that QA should not be mandated by government.

Capilano, Brisbane

- Effective AFB control is considered important, primarily from a chemical residues perspective. That is, when AFB infection rates increase, apiarists tend to use antibiotics (despite this not being a legal use) and increased levels of antibiotic residues are seen.
- Honey from SA is highly valued owing to low antibiotic residue rates – correlated with low AFB rates. Much higher rates are seen from Victoria and particularly NSW. Queensland rates are reasonable. Perception is that SA has younger apiarists than other states.
- Capilano takes one independent sample per year from each supplier and has it tested at EMAI in NSW at no cost to the apiarist.
- Residue testing is generally done on blended honey.
- Considers that government controls are still required. However agrees that the SA AFB approach is too hands-on from a government perspective.
- The ideal approach is testing, identification, notification and a legal requirement to clean up if positive. Monitoring of compliance should be through follow up testing. On-ground inspection and compliance activity should only occur following repeated positive tests.
- Regarding QA, B-Qual is strongly supported, with Bill Winner being a qualified auditor. Capilano supports accreditation through performing audits at discounted rates and paying a 5 cents per kg premium for honey from accredited apiarists.
- 70% of suppliers are accredited. However Capilano does not intend to make accreditation a mandatory requirement for supplying honey, owing to competition issues.
- SHB is seen as a major problem, especially in Queensland. It has had a major effect on smaller apiarists and probably on feral honeybees. Mention was made of the new product, Apithor which seems to be very effective for SHB control.
- Queensland is no longer seen as a major production state, with only 6 major suppliers.
- A major concern regarding a Varroa mite incursion is the likely increase in residues in honey resulting from control treatments.
- Is unsure about the real impact of AHB if it spreads further. The major concern expressed was competition between AHB and *A mellifera* for floral resources.
- Agrees generally with the direction of lower investment in AFB and greater investment in surveillance & preparedness. Also important that the program is viable.
- Interstate certification requirements should be abandoned.

7. Key findings, Recommendations and Discussion

- 1) South Australia has a valuable and forward thinking apiary industry that places great value on biosecurity to support industry competitiveness. The industry is supported by a government apiary program that is staffed by people who are passionate about the industry and extremely hard working.

The reviewer was impressed by the knowledge of and enthusiasm for the industry exhibited by those consulted. The SA industry has good levels of disease control and low levels of chemical residues. The former supports industry efficiency and the latter is valued by the food industry, given the higher levels of chemical residues seen in honey from other states. A redesigned program should attempt to maintain these competitive advantages.

Recommendation 1. Biosecurity SA should maintain an apiary program that supports the current competitiveness of the SA apiary industry.

- 2) The Biosecurity SA apiary program suffers from the lack of a documented project plan for its own apiary operations that includes aims, objectives, methodology and key deliverables.

While there is a well-documented industry strategic plan in SA, this does not substitute for proper planning within government. A key role of government is to support industry, but its program may not necessarily fully align with industry priorities. The industry strategic plan is also high level, as is the information about the apiary program on the Biosecurity SA web site.

This lack of detailed documentation presents problems for both staff and industry regarding clarity of purpose and expectations of the program. A number of industry members consulted stated that they were unclear what the program is delivering, particularly in relation to expenditure from industry funds collected through the voluntary levy.

Recommendation 2. Biosecurity SA should develop a project plan for its apiary program that has clear aims, objectives, methodology and key deliverables.

Some suggested aims, objectives and deliverables are given in section 9 (note these reflect a change in program focus as recommended below).

There is also a lack of specific policy statements on diseases of concern, hence it is not easy for people to find out the actions required of them or other consequences, particularly following a disease diagnosis (this is not unique to SA).

Recommendation 3. Biosecurity SA should include clear policy statements within its web pages in relation to each notifiable disease to inform apiarists of their responsibilities and actions that may be taken by government.

- 3) An analysis of current activities within the program indicates:
- a) A lack of strategic fit with the overall direction of biosecurity within SA and nationally. Specifically, there is an over-emphasis on controlling an endemic disease, AFB, rather than prevention, surveillance and preparedness for serious exotic pests and diseases.
 - b) There are insufficient resources, particularly field resources, to adequately carry out the range of activities being attempted. This is exacerbated by one field staff member having to perform some policy type roles.
 - c) There is significant potential to make current operations more efficient and responsive to clients through use of technology and alternative delivery mechanisms.
 - d) Emergency response preparedness has been neglected owing to competing priorities.
 - e) The surveillance program is too narrowly focused (not unique to SA).
 - f) There is limited reporting of outcomes and achievements.
 - g) Information provision to industry could be significantly improved, both in terms of passive methods (information on the web) and active provision of information to industry.

There was almost universal agreement that AFB control consumes too many program resources and that outcomes can be achieved more efficiently. Some suggested options for a revised AFB control program are provided in section 9 (subject to availability of resources – see later). An interesting comment from an apiary officer in another State is that AFB control is a “bottomless pit”. This is somewhat of a dilemma in that endemic disease control should be a lower priority for government than exotic disease surveillance and preparedness, yet low levels of AFB seemingly provides a competitive advantage for the SA industry. It should also be acknowledged that the current level of apiary inspections for AFB does provide a significant level of general surveillance for exotic pests and diseases.

Notwithstanding the above, it is not clear that the low AFB levels are entirely a result of ongoing government intervention. There may be some environmental or industry factors involved as well. Despite the practical realities, it is also difficult to publicly justify government investment in an AFB control program that has low chemical residues as a stated major outcome when it is illegal to use those chemicals to control AFB. It could be argued that the chemical residue issue should be tackled more directly. However it is acknowledged that compliance activity in this area is difficult, given that the same chemical can be legally used to treat for EFB.

The issue of whether the AFB control targets contained within the industry strategic plan are realistic is also open to debate. It could be argued that there would be little overall benefit in reducing AFB levels to 9% of operations from the current 15-20%, considering the resources required and the fact that the SA industry already enjoys a favourable reputation.

Finally, apiarists have well documented AFB control methods available to them. The only real justification for any government intervention is the lack of control that individual apiarists have over the risk of disease introduction from neighbouring apiaries.

- 4) All industry sectors are particularly concerned about the impacts of a potential (many say inevitable) Varroa mite incursion. Specific impacts would be lowered production, increased management costs, reduced pollination from feral honeybees and an under-supply of paid pollination services. The industry is unlikely to be able to meet the demand for pollination services, especially in the short to medium term.
- 5) There is general agreement that the apiary program should be redesigned, with a much greater emphasis on prevention, surveillance and preparedness for exotic pests (particularly Varroa mite) and that endemic disease control should be largely an industry responsibility supported by efficient testing, reporting and education.

Recommendation 4. The Biosecurity SA apiary program should be redesigned so that the major emphasis is on prevention, surveillance and preparedness for exotic pests (particularly Varroa mite).

Recommendation 5. The AFB components of the revised program should attempt to maintain the current relatively low prevalence levels, but should also include a major shift towards industry responsibility for managing this endemic pest.

With these key changes, the program would align much more strongly with the state government biosecurity priorities, as well as national priorities. The elements of the project plan provided in section 9 reflect these changes. It should be noted that for these changes to occur, industry priorities for expenditure of industry funds will also need to change.

- 6) Outcomes from the current AFB control measures are difficult to assess. Prevalence rates appear to be relatively static, but it should be acknowledged that the current low prevalence compared with other States, that has been linked with lower levels of antibiotic residues, most likely provides SA with a competitive advantage.

Recommendation 6. There should be increased emphasis within the project plan on measuring and reporting outcomes.

This is not only important from a project management perspective, but is also important in assisting industry to manage disease issues and to maintain interest.

Recommendation 7. Project design should match available resources to deliverables, with lower priority areas being dropped off when insufficient resources are available.

If it is accepted that endemic disease control is lower priority for government than exotic disease preparedness and surveillance, then the challenge is to design a program that enables industry to maintain high standards and thus a competitive advantage. In general, this means designing systems that encourage and support industry management.

However, if resources remain limited, then tough decisions will need to be made. In particular, all government input into AFB control may need to be withdrawn apart from maintenance of information on the web and the AFB testing & reporting aspects of the program.

This change will be difficult for both industry and government to manage. As an endemic disease, AFB is “front of mind” for individual apiarists and AFB control is seen as a key and visible service provided by the existing government-industry investment in the industry. Investment in exotic disease surveillance and preparedness is inherently less visible, with much longer-term outcomes. The challenge will be for industry leaders to “sell” the long-term advantages and for the government program to be designed so that it is visible to individual apiarists.

Recommendation 8. Program methodology should place a greater emphasis on facilitation, education and information provision, rather than regulatory activity.

This recommendation aligns with the overall direction of industry self management of endemic diseases and better awareness about exotic diseases. During consultation, there as almost universal calls from industry stakeholders for better information provision from the program.

It should also be noted that Biosecurity SA currently has only one specialist compliance investigator and that the apiary program utilises a disproportionately large proportion of this officer’s time (around 30%). Much of this time is taken up with pursuing apiarists who have not paid registration fees or not submitted a honey sample. This area could be streamlined significantly through expiations and other mechanisms such as de-registration coupled with market place exclusion.

Recommendation 9. The Biosecurity SA web pages in relation to apiaries should be redesigned to be more responsive to client needs.

A number of comments were received that information on the web site was difficult to access and not sufficient for purpose.

Comments were also received that some processes such as registrations, renewals, and certification requests would be more efficient if they were available on-line. However this functionality can be expensive to develop, so further action will first require development of a business case looking at costs and benefits.

An important initiative suggested was development of an electronic notification (SMS or email) to industry that could be used for dissemination of information, as well as disease alerts.

Recommendation 10. That the potential for development of on-line and other electronic processes & systems be further examined.

It was also suggested that allocation to apiarists of an identification code similar to that used in the livestock industries would be useful for a range of purposes, including tracing of product and documentation through the production chain. This would be similar in concept to the property identification code (PIC), but allocated to an apiarist, rather than to land. This suggestion makes sense and should be relatively simple to implement. However it would be best if there was agreement to implement this nationally, considering the level of interstate movement of hives and products within the industry.

Recommendation 11. That implementation of an apiary identification code system within the apiary industry be further investigated.

- 7) The current specialist apiary human resources are less than what is required to carry out current program activities and, even with program restructuring, marginal in terms of the level required to maintain an adequate capacity and capability to respond to new & emerging issues (critical mass).

Maintenance of critical mass is a key issue across biosecurity programs Australia wide. However it is particularly evident in specialist areas such as support for small industries like the apiary industry. While the industry is relatively small, the impact of a major incursion like Varroa mite would be significant across a range of other agricultural industries. Hence maintenance of a critical mass of specialist staff in this area is considered essential. Two full time officers is considered more appropriate than the current arrangement, so that the range of issues to be covered (including officers' leave) can be managed more effectively, and that national performance standards or baseline capacity can be maintained. Importantly, if current cost recovery targets cannot be met, it is not considered appropriate to further reduce the number of specialist staff.

Recommendation 12. That the current number of specialist apiary officers is increased to two full-time officers, or equivalent, subject to funding availability.

Recommendation 13. There should be a clearer separation of roles within the program, particularly in the areas of policy development and support for industry advisory / management structures.

It is difficult for apiary officers to perform program tasks, as well as carry out policy roles and support industry advisory processes. These roles should be given to one or more policy officers. However it is acknowledged that this is not easy in a State that has a relatively small animal health program and policy officers are required to cover multiple portfolios. Filling of the part-time support position for HISPIC would assist. This issue is discussed further in section 9.

- 8) There is inadequate recruitment and utilization of industry resources and expertise to support the apiary program. This applies particularly in the areas of education, surveillance and participation in response teams.

While the general policy move is towards greater industry funding of the Biosecurity SA animal health program, industry self reliance is a legitimate alternative or adjunct to cost recovery. The amateur apiarists society is particularly keen to become involved in this area and there is potential for collaboration with other States, particularly Victoria, which has already established a strong response team involving members from industry. As mentioned earlier, the Bee Society of South Australia has requested some in-kind support from government to assist them in implementing this initiative.

Recommendation 14. That industry is supported to make a greater in-kind contribution to the apiary programs, particularly in the areas of surveillance, emergency preparedness and education.

Particular initiatives that should be progressed are recruitment of apiarists to conduct regular exotic disease surveillance (especially in high risk areas); recruitment of apiarists onto a rapid response team; and support for industry to run training programs.

Recommendation 15. That access to government facilities or land by industry for the purposes of conducting training programs is investigated.

Recommendation 16. That discussions be held with Victoria regarding possible joint management of, utilisation or contribution to that State's Quarantine Response Team.

While there may be practical difficulties, this initiative is worth exploring given the high cost of running training programs and the regular movement of apiarists between the two States.

- 9) There is strong support amongst stakeholders for the broad application of quality assurance throughout the industry.
- 10) While some stakeholders, particularly HISPIC and the SAAA, advocate government mandating of QA, this is not a universal view and, importantly, is seen as difficult to justify from a government perspective. Incentives and / or market signals through the supply chain were regarded by many of those consulted as most appropriate.

This issue was hotly debated during consultation. The primary reason presented for mandating QA was to use it as a mechanism for apiarists to take greater responsibility for disease control, particularly AFB. While it was generally accepted that QA is primarily an industry responsibility, there appears to be a lack of drivers within the system for universal adoption. Ideally, take up of QA should be driven through the marketing system. This has worked well in the feedlot industry. However it would require an agreement to be made amongst honey packers at the national level and this appears unlikely in the foreseeable future.

The argument from industry for government to mandate QA, essentially centres around the need for a strong driver and for government to provide this in the absence of other drivers, and that mandatory QA would enable government to draw back from direct involvement in AFB control. From a government perspective, the SA food safety legislation is the only legislation that mandates QA programs and it does not cover honey. Further, a 2002 food safety risk assessment did not identify risks associated with honey sufficient to warrant mandatory QA.

The reviewer is not aware of any mandated QA programs in Australia that have biosecurity as a major purpose.

Ultimately a decision on this issue is a matter for government, in consultation with industry. However this reviewer could not mount a compelling argument for government intervention.

One other mechanism suggested during consultation was the introduction of a "licence to operate" in conjunction with the biosecurity fee. One of the licence conditions would be implementation of a QA program. There would need to be an exemption for smaller apiarists. This option suffers from the same problems as mandatory QA in terms of justification for government intervention, but could be the subject of further industry-government dialogue.

Recommendation 17. Government programs should encourage the use of third party audited QA programs within the apiary industry, however they should not be mandated.

Some suggestions are made in section 9 regarding how government could encourage QA programs.

- 11) There are significant concerns regarding the ability of the apiary industry to pay the full costs of the apiary program, given the size of the industry and its profitability. Full cost recovery would amount to up 10% of the current industry operating surplus. It should also be noted that a changed program focus will change the government expectation of what is an appropriate level of industry contribution. Government has stated that only a proportion of surveillance and emergency preparedness activities will be cost recovered.

Recommendation 18. That the level of cost recovery from the apiary industry be re-examined in light of the suggested changes to the focus of the apiary program.

The main focus of the revised program will be on prevention, surveillance and preparedness for exotic pests and diseases, which are seen as a core government responsibility, in partnership with industry. The critical mass issues discussed earlier are also a consideration here.

Another consideration that is hotly debated is the benefit to other industries from pollination services and whether they should pay. While this reviewer accepts the argument that additional industry costs of the program can be passed onto receivers of pollination services through fees charged, pollination from feral honeybees is another matter. Feral honeybees are not part of the apiary industry, yet a number of agricultural / horticultural industries will suffer significantly from the effects of a Varroa mite incursion as a result of die-off of feral honeybee populations. Hence there is an argument for these industries to contribute to the aspects of the program dealing with prevention, surveillance and preparedness for Varroa mites, rather than the apiary industry.

Section 8 provides a suggested cost recovery strategy for discussion purposes only.

Recommendation 19. That contribution of agricultural / horticultural industries to funding prevention, surveillance and preparedness for Varroa mites be further examined.

This suggestion is incorporated into the analysis provided in section 8.

Section 9 also contains a suggestion for more aggressive forms of cost recovery where regulatory intervention is required.

Recommendation 20. That full, direct cost recovery be implemented for cases where on-ground regulatory intervention needs to be taken against recalcitrant apiarists.

A problem with this approach is that it will further tie up apiary officers' time when the focus of the program is changing. Use of third party providers would get around this problem, although this would be cost neutral, rather than increasing the level of cost recovery.

Recommendation 21. That use of third party providers under the direction of an inspector be investigated for some regulatory field operations, for example clean up of AFB or abandoned / neglected hives.

It should also be noted that for abandoned / neglected hives that are situated on private property, the responsibility of the land owner should be clarified. The strong feeling from industry was that land owners should not be charged as this will lead to under-reporting and / or removal of access to these sites. Direct charging of the apiarist was strongly supported.

8. Resources required and potential industry funding mechanisms

As indicated earlier, it is not envisaged that the total cost of the apiary program can be reduced significantly, given critical mass issues and the need to invest more in prevention, surveillance and preparedness. In fact, a redesigned program may have higher operating costs and ideally should have two full time specialist apiary officers. A moderate increase may be to around \$450k compared with the current \$400k program. However for this to occur it is acknowledged that industry would need to contribute.

Regarding industry's ability to pay, there are profitable businesses within the industry, but there are many that are marginal. As indicated earlier, the average cash receipts and operating surplus per business are \$103,700 and \$42,700 respectively. According to the 2006-07 RIRDC survey the average cost of production per hive is \$264 (this includes family and labour costs) and the average price received is \$240 (96 kg per year production times \$2.50 per kg).

Significant to consideration of this issue is that while PIRSA is aiming to achieve 100% cost-recovery for endemic disease control, it is aiming for a lower level of cost recovery for surveillance and emergency preparedness. If the Apiaries program is restructured as suggested, this will reduce the amount to be cost recovered from industry. This may place greater pressure on the PIRSA budget in other areas.

Regarding potential ways of industry providing a greater contribution:

- Hive registration fees may be increased and it seems to be generally accepted that this will occur.
- The industry levy (currently \$1 per hive) may be increased. However too great an increase is likely to cause more apiarists to opt out (technically this levy is voluntary). There would need to be a strong education program regarding the benefits of the levy.
- A biosecurity fee should be levied per apiary, consistent with its introduction for livestock. However this needs to be constructed carefully in relation to the ability of operators to pay.
- While open to debate, a more broadly based fee across beneficiary industries has merit. The primary justification is that a major impact of Varroa would be on feral bees, with direct flow-on problems for agriculture and horticulture. The effect of Varroa on apiarists is a separate issue. Currently there is no mechanism for this, but it could be introduced in the future.
- Greater levels of direct cost recovery for services, for example certification, managing abandoned / neglected hives, is justified. However the increased revenue is not likely to be great.
- A more radical suggestion made in the following section is that unless an apiary includes AFB control within their QA program, all visits and inspections are conducted on a full cost recovery basis.
- Greater in-kind contributions from industry members is strongly supported, but is not likely to significantly reduce the cost of the program, given the critical mass issues already mentioned. Rather, this will improve the effectiveness of the program using the existing resource base. In other words, it should be seen as a greater industry contribution, but not one that replaces existing resources.

Given all of the above, the view of this reviewer is that achievement of the revenue targets as outlined in the Livestock Bill discussion document will be difficult. For discussion purposes only, the following table presents one view of what could be argued to be reasonable and achievable, given the change in emphasis within the program.

Funding source	Current	Revenue	Proposed	Revenue
Registration fee ¹	\$22.20 per apiary	\$19,092	\$38	\$32,680
PIFS levy ²	\$1 per hive	\$62,000	\$2 per hive	\$120,000
Biosecurity fee (a) ³	0		\$100 per apiary	\$38,000
Biosecurity fee (b) ⁴	0		levy per agriculture / horticulture property	\$50,000
Fee for service ⁵	0		\$50 per certificate; \$1000 per neglected hive cleanup	\$10,000
Total revenue		\$81,092		\$250,680

Revenue – expenditure analysis	
In-kind ⁶ (industry volunteers)	\$100,000
Total industry contribution	\$350,680
Cost of government operations ⁷	\$450,000
Total program expenditure (government and industry)	\$550,000
Deficit (or government contribution)	\$199,320
Proportion of direct industry funding of government operations	56%
Proportion of industry funding of the total program	64%

Notes:

1 – An increase has already been foreshadowed and \$38 will bring it in-line with the PIC fee.

2 – While increasing this fee was seen as problematical, a modest increase is probably justified. The figures assume a moderate increase in apiarists opting out

3 – This is a biosecurity fee under the Livestock Act set at \$100 per apiary for those with more that 10 hives (380 apiarists)

4 – This is a theoretical biosecurity fee for agricultural / horticulture industries that receive a major benefit from pollination by feral honeybees. It could not be introduced under the Livestock Act and would need to be introduced at a later date and only if such a fee was being envisaged for those industries. It is set here at a nominal total figure and it is acknowledged that there is currently no proposal for such a fee.

5 – Based on an assumed \$50 per certification and \$1000 per neglected hive cleanup operation. Could be increased further if all AFB on-ground operations were cost recovered. However, may also be reduced if third party providers utilised.

6 – Nominal figure based on roughly 1 FTE, ie industry volunteers.

7 – Assumes a moderate increase above that the current cost as outlined in the Livestock Bill discussion document.

There needs to be further detailed discussions around these issues involving policy makers and stakeholders.

9. Implementation issues

The recommendations contained in this review represent a significant departure from current practice and may take some time to implement. There will be a culture change required both within the Department and within industry. Importantly, change will not happen automatically and will require careful management and strong leadership from within Biosecurity SA, as well as from industry leaders.

As recommended, a change in staffing arrangements will be necessary to support the new program along the following lines:

- Policy officer – 10%, but possibly up to 30% over the next year during the transition phase. Responsibilities include policy development, facilitating design of new systems and project planning (new).
- Executive officer – 10% to support industry advisory processes (new).
- Apiary officers – ideally 2 to carry out operational duties (increase from current 1.6 FTE).
- Compliance staff – 0.2 FTE to perform specialist regulatory duties, such as investigation and prosecutions (reduction from the current 0.3 FTE).
- Registration staff – 0.2 FTE (no change).
- Other. Support will need to be provided by other animal health officers, web design staff etc.

Duties of the apiary officers will differ significantly from what occurs currently. These are reflected in the project plan that follows, but the emphasis will be on education, facilitating establishment of surveillance activities, training for emergency responses, supporting industry groups, etc.

Regarding the recommendation to develop a project plan for the program, this needs to be developed internally in consultation with stakeholders. However as a starting point, some key aims, objectives and deliverables could include (this is not intended to be a complete set, but reflects the changed focus suggested for the program):

Aim. Protect the SA Apiary industry from the negative impacts of significant exotic and endemic diseases.

Objectives:

- 1) In conjunction with AQIS and industry, implement measures that will reduce the likelihood of serious pest and disease threats from establishing in SA.
- 2) Implement an effective surveillance system that (a) is able to detect new incursions as early as possible and (b) demonstrates South Australia's favourable pest and disease status.
- 3) Develop effective systems for responding to exotic pest and disease incursions and maintain a critical mass of trained personnel who are able to mount such a response.
- 4) Implement systems that maintain effective levels of management of serious endemic pests and diseases within the apiary industry through encouraging industry self reliance.

Deliverables

- 1) Implement a revised national apiary surveillance system by 30 June 2012.
- 2) Recruit 50 apiarists to undertake regular Varroa mite surveillance by 31 December 2012.
- 3) Support the Bee Society of SA to run 12 training / education courses for apiarists per annum covering all aspects of apiary biosecurity.
- 4) Publish the results of active and passive surveillance activity twice per year.
- 5) All apiary staff to attend at least one emergency response training session per year.
- 6) Maintain a rapid response team of trained apiarists and broader PIRSA staff, with at least one training session held per year.
- 7) Implement revised AFB control system by 30 June 2012.

Regarding design of the revised AFB control program, there are a number of options, depending on the agreed level of government intervention. Again detailed design needs to occur in conjunction with stakeholders. However elements envisaged for four different systems follow. Each option attempts to reduce the level of government input compared with the current program. Option 2 is favoured by this reviewer.

Option 1 (industry managed)

- Honey testing, at least twice per year encouraged. Paid for by industry and organised by honey packers.
- Regular publishing by government of AFB diagnostic trends.
- Streamlined reporting of AFB results to apiarists.
- Investigation of the effectiveness of on-site test kits.
- An enhanced education program primarily managed by industry.
- Updated Code of Practice for control of AFB that includes ongoing management practices, as well as control measures in the face of an outbreak.
- Encouragement for industry to include the code of practice within QA manuals.
- The legal rights of apiarists and land owners in relation to abandoned / neglected hives is clarified and publicised.

Option 2 (soft regulatory approach)

As for option1, but also includes:

- Mandatory honey testing, at least twice per year, paid for by industry and organised by honey packers.
- Increased use of expiations for those who do not comply (for example apiarists who do not market through honey packers).
- AFB control is not mandatory at the apiary level.
- Enhanced honey residue testing program and strong compliance action taken in relation to non-compliance with MRLs.

Option 3 (revised regulatory approach)

As for option 2, but also includes:

- Control of AFB at the apiary level is mandatory.
- Mandatory enhanced testing frequency following positive AFB tests.
- Regulatory action to be taken only if there are ongoing positive test results, and any on-ground work to be conducted on a full cost recovery basis.

- Action on abandoned / neglected hives to be taken by property owners or third party providers at full cost to the hive owner. Government intervention to be a last resort and also at full cost recovery.

Option 4 (enhanced regulatory approach)

As for option 3, but also includes:

- Apiarists have two options for oversight of their program:
 - a) Inclusion of their AFB control program within their third party audited QA program (could also include the “licence to operate” concept discussed earlier).
 - b) Government or third party provider oversight with full cost recovery for all visits and inspections.

There is a question mark regarding whether third party providers are or could be available to work within the industry. This needs further exploration, and may require a tender or expression of interest process. It may be a role that some existing apiarists may be will to undertake as an additional revenue stream.

Another issue that needs to be considered is that implementation of some recommendations, for example redesign of web pages and automating of some processes is likely to require some additional, short term investment for which there are currently no project funds. These investments will need to be considered at the Executive level.

Attachment 1

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_discussion paper 2011 cost recovery and enhancements to Act final draft 5-
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A number of State agency websites were also referred to for details of their programs, as well as information of specific pests and diseases.

Attachment 2 Individuals and organisations consulted

Biosecurity SA

- Will Zacharin
- Rob Rahaley
- Chris Etherton
- Elena Petrenas
- Jack Van Wijk
- Michael Stedman
- Peter Zviedrans
- Geoff Raven
- Mark Langman
- Kevin Glover

Department of Agriculture Fisheries and Forestry, Canberra

- Lois Ransom
- Iain East

Department of Primary Industries, Victoria

- Russell Goodman

Department of Primary Industries, NSW

- Ian Roth
- Sally Spence
- Bronwyn Hendry

Department of Primary Industries, Parks, Water and Environment, Tasmania

- Rod Andrewartha

Department of Resources, Northern Territory

- Brian Radunz

Biosecurity Queensland

- Allison Crook
- Hamish Lamb

Honeybee Industry Strategic Plan Implementation Committee

- Gerald Martin
- Barry Pobke
- Ian Zadow
- Allan Cotton

South Australia Apiarists Association

- Ian Roberts (Chair)
- Craig Dyer
- Allan Cotton
- Tim Crowe
- Barry Pobke
- Ian Zadow
- Keith Gibbs
- Wendy Thiele
- Ben Hooper
- Graham Brooks

- Gerald Martin, HISPIC chair also attended

Bee Society of South Australia

- Paul Frost
- Bob Beer
- Lin Hunter
- Bill Scott

Independent Apiarists

- Leigh Duffield
- Graham Lines
- John Tenney
- Michael Pitt
- Ken Grossman

Australian Honey Bee Industry Council (AHBIC)

- Stephen Were

Plant Health Australia (PHA)

- Sharyn Taylor

Apple and Pear Growers Association

- Greg Cramond

Cherry Growers Association

- Grant Wotton

Lucerne Australia

- Shane Oster

Almond Board of Australia

- Ben Brown

Spring Gully Honey Packers, Adelaide

- Kevin Webb

Capilano, Brisbane

- Bill Winner

Attachment 3 SA Apiary Registration Statistics

South Australia Apiary Registration Statistics as at 19/09/2011

	Registered Apiarists			Unregistered Apiarists			Total		
	No. Apiarists	No. Hives	QA Certified	No. Apiarists	No. Hives	QA Certified	No. Apiarists	No. Hives	QA Certified
0	18	0	0	3	0	0	21	0	0
1 - 5	412	1,085	6	22	51	0	434	1,136	6
6 - 19	215	2,444	19	14	179	0	229	2,623	19
20 - 49	55	1,934	8	2	66	0	57	2,000	8
50 - 99	35	2,544	11	1	57	0	36	2,601	11
100 - 499	104	25,551	50	6	988	0	110	26,539	50
500 - 999	27	16,818	20	1	700	0	28	17,518	20
1000+	8	11,144	3	0	0	0	8	11,144	3
Total	874	61,520	117	49	2,041	0	923	63,561	117

Source – Biosecurity SA Registration database

South Australia Apiary Registrations by Category by Year

Year	2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011
No. Hives	No. Apiarist Registrations	No. Apiarist Registrations	No. Apiarist Registrations	No. Apiarist Registrations
0	13	17	21	20
1 - 5	296	323	336	394
6 - 19	182	182	198	215
20 - 49	44	45	58	56
50 - 99	32	38	37	35
100 - 499	120	116	99	104
500 - 999	33	27	32	27
1000+	9	10	9	9
Total Apiarists	729	758	790	860
Total No. Hives	67,852	64,232	63,108	62,578

Source – Biosecurity SA Registration database

Attachment 4

Biosecurity Risk Factors for the Apiary Industry

- *Increased international travel of people.*

The volume of interceptions by AQIS of risk materials in personal baggage and mail articles is significant. The cosmopolitan nature of Australian society also brings risks in terms of a significant proportion of the population having relatives living overseas. Skilled migrants are also coming to Australia in ever increasing numbers for temporary work, some helping to address a critical labour shortage in agriculture.

- *Changing patterns of commodity imports.*

Imports from countries with lower biosecurity standards present risks both in terms of the commodity itself, as well as packaging and containers. Examples include Asian honey bee and tramp ant incursions through container and machinery movements.

- *Spread of invasive species within near neighbour countries and ports with which we trade. The proximity of Northern Australia to PNG and South East Asia.*

The level of investment in biosecurity in our near neighbours Papua New Guinea (PNG) and Indonesia is low. The proximity of PNG to Australian Islands in Torres Strait, together with traditional movements in this region presents an obvious risk. However shipping movements also present a significant risk.

- *Changing attitudes or risks people are willing to take to attain a competitive edge.*

Agricultural industries operate within a competitive environment. In situations where superior genetic material may exist overseas, people may be tempted to introduce material illegally, especially where our quarantine system either prevents introduction or is costly. There are a number of examples where this has led to disease outbreaks in Australia. Given the size of honeybees, smuggling into Australia of new genetics through queen bees would be relatively easy to achieve.

- *Nomadic nature of apiary industry.*

Unlike other Agricultural industries apiarists generally move their animals to sites where food is abundant. This creates additional risk when bees are exposed to bees from other apiarists who may have different standards of disease control.

- *Changing demographics*

The “sea change” phenomenon has seen an increasing “peri-urban” agriculture sector. These farmers have varying levels of understanding about biosecurity and through poor biosecurity practices may allow establishment of invasive species that would not otherwise occur. This is compounded by lower reporting rates (early detection) in these areas and an increased propensity for many pests & diseases to spread in closely settled areas.

- *Diversification of Industries and Changing Land Use*

In difficult economic times, many producers are diversifying and growing new commodities. This brings risks in terms of our level of knowledge of these crops and the associated risks, both through pests & diseases and associated chemical use. Changes in land use can also bring significant risks in terms of chemicals & contaminants from previous use. Minor use permits are often needed for newer fruits & vegetables, as AgVet companies do not see a return on investment for the required R&D.

- *Substitution and contamination of AgVet Chemicals*

With increasing price and global demand for agricultural chemicals and fertilizers, there is a growing trend for fraud, substitution or the use of poor quality supplies which can lead to toxicity or market access issues.

- *Appearance of New or Emerging Diseases*

Over the past 15 years there have been a number new diseases that have emerged both in Australia and overseas across a range of industries. Of particular relevance to the apiary industry is Colony Collapse Disorder.

- *Climate change*

The natural distribution of many invasive species is determined by climate and geography, with temperature and rainfall patterns two of the most important determinants. Climate change will thus affect the potential distribution and intensity of many invasive species infestations, both positively and negatively. Some species may emerge as more important threats than currently assessed, while some may become less important. This applies to both endemic species as well as exotics and there is a risk that endemic species could become biosecurity risks as their distribution changes.

- *Naturalisation of garden and pasture species with weed potential*

A large number of plant species were introduced to Australia for garden or pasture purposes prior to the commencement of weed risk assessment in the late 1990s. Some species are widely distributed as major weeds but many are still at early stages of naturalisation and invasion, and it is likely that many have not yet naturalised (that is, established outside cultivation). Weeds can have positive and negative impacts on apiaries in terms of access to floral resources.

- *Increasing International Standards and Market Access Requirements*

Our primary industries are heavily reliant on access to interstate and international markets and much of Australia's competitive edge in world markets rests with our 'clean and green' status. Maintaining good biosecurity standards that meet international standards is crucial to keeping our current markets and opening up new opportunities. In particular markets require assurance about the safety of products through traceability systems and effective surveillance systems. There is also a need for greater harmonisation and integration across the States.

- *Increasing national obligations and cost sharing.*

Because of the importance of biosecurity, especially for trade, there are an increasing number of new national biosecurity priorities, with a reliance on costs

to be shared between the Commonwealth, States and Industry. This system is cumbersome and prone to a very mixed result in terms of commitment by all parties. State agencies are finding it increasingly difficult to convince Treasuries that these national programs require additional funding commitments. Similarly, it is difficult to get industry agreement to significant new funding commitments.

- *Reliance on the border*

Australia's biosecurity system relies on cooperation between the Commonwealth and the States to fulfil roles across the biosecurity continuum. The States largely rely on AQIS programs at the border to prevent incursions from overseas. However the risk of barrier failures is to a significant degree borne by the States. This will continue to be the case. Thus it is the State's best interests to influence as much as possible quarantine policy.

- *Community expectations*

People generally have increasing expectations about a range of issues, particularly food safety and animal welfare. Increased demand for food safety as our population ages will demand better traceability, auditing and QA of supply chains. This will occur alongside a trend for increased food chain lengths as world food market becomes more global and hence increased risks to food safety due to time delays and volumes involved. We can expect more auditors from developed countries to inspect a wider range of issues.

- *Food security*

Food security and the need for higher levels of production is becoming a world wide trend. Agvet chemicals are often required to keep production levels high, bringing associated risks.

- *Security of floral resources*

Some sectors of industry consider that reduced access to state forests and parks thus reducing the "robustness" of their bees and resistance to pests and diseases is a significant risk.

- *Unintended effects from use of agricultural & veterinary chemicals*

There have been a number of incidents in the past arising from chemical residue detections. The economic impact of these is generally associated with loss of market access, for example, the residues from Helix® (used on cotton) cost the export beef trade \$40 -100m. The apiary industry is vulnerable to similar risks through direct and indirect use of agvet chemicals.

- *Natural Toxins & other chemical contaminants.*

A sleeper issue is the possible presence of natural toxin residues such as pyrrolizidine alkaloids from plants being present in food and causing market access issues.

- *Decreasing investment by chemical companies in pest & disease control technology*

The high cost of developing new chemicals for pest & disease control is reducing investment in this area, especially for smaller volume commodities. This is likely to reduce our arsenal for control, as well as creating a climate where there is greater off-label use, causing residue issues.

- *Technology*

Modern diagnostic tests are now much more sophisticated at diagnosing invasive species, especially animal diseases. While they have brought major improvements in how we manage disease incidents, their use can also create biosecurity incidents from the very fact that we become aware of a pathogen's existence. Similarly, we now have technology for multiple screening for agvet chemical residues that will be able to screen for multiple residues from one sample and at lower and lower levels.

- *Risk of Bioterrorism*

Owing to the potential economic and social impacts of significant pest & disease incursions, there is a risk that introduction of invasive species could be used by terrorists. This is an area that we can do little about in terms of prevention. However preparedness and relationships with law enforcement agencies is crucial.