6

Research, extension and training

6.1 Research, extension and training have been identified as critical areas affecting the current and future prospects of the Australian honey bee industry. The need for improved training and extension has been identified as a significant issue for an industry facing many pressures, economic and otherwise; while a significant increase in the industry's research capacity has been highlighted as essential to meeting the threat of Varroa as well as the many other challenges facing the industry. Both industry and government will face significant costs and challenges in meeting these increased research needs.

Current research priorities and funding

6.2 RIRDC is the organisation overseeing the national research effort in the honey bee industry. Research and development has been guided through a series of five year plans formulated in consultation with stakeholders. Projects are selected and managed by RIRDC and the RIRDC Honeybee R&D Advisory Committee. The Advisory committee is made up of persons with a range of skills and experience relating to research, production, processing and marketing within the industry and representatives of RIRDC. The committee makes recommendations on the allocation of funds (contributed by industry and government) to the RIRDC Board.[1]

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1 RIRDC, Submission no. 54, p. 5.

6.3 In its *Honeybee R&D Five Year Plan 2007–2012*, RIRDC outlined the following research objectives (for full details, see Appendix A):

- Pest and disease protection (45% of funding);
- Productivity and profitability enhancement to lift beekeeper income (15%);
- Resource access security and knowledge (10%);
- Pollination research (10%);
- Income diversification including new project development (10%); and
- Extension, communication and capacity (10%).[2]

6.4 The research priorities identified here accord with the issues raised in previous chapters of the report.

6.5 Funding for this research program is obtained through industry levies. A domestic levy, or alternatively an export charge, is payable on honey to provide funding for research and development and residue testing programmes for the honey industry. The domestic honey levy is payable on honey produced in Australia, and honey produced in Australia and used in the production of other goods.

6.6 The honey export charge is payable on honey produced in and exported from Australia. No export charge is payable if domestic levy has already been paid on the honey to be exported.

6.7 The rate of the domestic levy/export charge for honey sold or used in the production of other goods from 1 July 2006 is 2 cents per kilogram. The rate prior to 1 July 2006 was 1.6 cents per kilogram. The rate will increase again on 1 July 2009 to 2.3 cents per kilogram.

6.8 The domestic levy/export charge rate of 2 cents per kilogram is split and distributed as follows:

- 1.2 cents per kilogram for research and development (RIRDC);
- 0.5 of a cent per kilogram for Emergency Animal Disease Response (EADR) levy; and
- 0.3 of a cent per kilogram for the National Residue Survey (NRS).[3]

2 RIRDC, *Honeybee R&D Five Year Plan 2007–2012*, RIRDC Publication no. 07/056, April 2007, p. 21.

3 DAFF, Submission no. 20, p. 30.

6.9 The levy paid by beekeepers for research is matched on a dollar for dollar basis by the Australian Government up to 0.5% of the industry's gross value of production (GVP). The levy raises between $350,000 and $450,000 per annum and funds approximately 12 projects per year. Around $10,000 per annum is also provided by queen bee producers via a statutory levy.

6.10 The industry has voted to support an increase in its levy over the life of the new R&D plan. The levy increased from 0.8 cents/kg of honey sold by beekeepers to 1.2 cents/kg from 1 July 2006 and will increase again to 1.5 cents/kg from 1 July 2009. The levy increase will eventually lift R&D funds available to the industry by up to $200,000 pa when Australian Government matching funds are added to the additional levy.[4]

6.11 In its submission, RIRDC noted that it had been able to achieve a useful leverage rate for the grower levy and matching Commonwealth funds: 'Every dollar invested by RIRDC has attracted another $2.40 from other funding sources'.[5]

6.12 In evidence presented to the committee, DAFF noted that the research and development model applied to the honey bee industry was the same as that applied to all agricultural industries. [6] A DAFF official stated in evidence:

> The model is the model that has been deemed appropriate for all rural industries. It tries to provide a balance between an industry contribution which is set by the industry and the government providing a matching contribution to that. So it is really for the industry to decide whether they want to increase the levy rate and then they can attract additional government funding up to the GVP cap.[7]

Future research funding

6.13 Despite the position taken by DAFF, the bulk of the evidence submitted to the committee on the question of research funding

4 RIRDC, Submission no. 54, p. 11.
5 RIRDC, Submission no. 54, p. 7.
6 Mr Michael Ryan, DAFF, *Transcript of Evidence*, 13 June 2007, p. 14.
7 Mr Michael Ryan, DAFF, *Transcript of Evidence*, 13 June 2007, p. 15.

indicates that the level of funding is totally inadequate. In his submission, Dr Max Whitten noted that:

> The obvious problem with the 5-year R&D plan is not the priority settings. Instead, it is the meagre quantum of funds available; and who is available and able to conduct the necessary research. For example, resource access and pollination research each have been allocated around $40,000, i.e., 10% of a total budget of some $400,000. Given that the value of honeybee pollination to horticulture and pastures is somewhere between $3 and $4 billion dollars, it is clearly unacceptable to allow this situation to continue.[8]

6.14 In its submission, the Victorian Apiarists' Association stated:

> Clearly, the Australian honeybee industry's capacity to adequately fund required research through its matched statutory research levy on production has its profound limitations. The small industry does not have the economies of scale of larger primary industries where even modest statutory levy rates generate research funds significant in order of magnitude. Through its RIRDC honeybee R&D program the industry has been doing its best with quite a meagre budget of around $400,000 p.a.[9]

6.15 In its submission, the Western Australian Beekeepers' Association stated:

> The industry faces a major problem in being able to adequately fund its R&D. The current mechanism whereby a small levy placed on sale of its products (honey and queen bees), is then matched $ for $ by the federal government, results in a sum of money that in today's research environment amounts to little more than petty cash. Added to which, any downturn in production, (such as that resulting from the current drought), results in a corresponding downturn in research funds availability, making it very difficult to maintain continuity of funding to larger or longer term projects. As the industry winds down under the weight its financial insufficiency, so will its research funds. A future as a researcher in honey bees is currently as bleak as a future in beekeeping. At the time when we most need research and

8 Dr Max Whitten, Submission no. 38, p. 6.

9 Victorian Apiarists' Association, Submission no. 71, p. 39.

> development to lead the way forward, we find ourselves least able to afford it.
>
> The industry urgently needs to find a way out of this situation.[10]

6.16 The research needs of the honey bee industry are potentially huge, and clearly beyond the resources of the industry itself. The CSIRO has modelled the economic impact of a Varroa incursion upon Australia. Its submission stated:

> With the information currently available CSIRO has been able to demonstrate the substantial impact *V. destructor* is expected to have on the economy if it were to become a naturalised species, and through this the benefits of maintaining Australia's area free from this pest. The expected benefits to 25 plant industries of remaining free from the pest over the next 30 years have been estimated using a stochastic impact simulation model. In total, CSIRO estimates that these benefits would be between $21.3 million and $50.5 million per year if area freedom could be maintained. This benefit is not reflected in current incursion response cost sharing arrangements. This analysis is also based only on 25 plant industries. The magnitude of the benefit will therefore increase should all plant industries with some reliance on *A. mellifera* be included.[11]

6.17 CSIRO argued that there was a strong case for other beneficiaries of Varroa exclusion making a contribution to Varroa research and biosecurity measures:

> The results suggest that private beneficiaries of *V. destructor* exclusion are not only apiculturists, and that current cost sharing arrangements for incursion responses do not adequately reflect the spread of potential benefits. The substantial expected benefits of *V. destructor* exclusion estimated suggest that perhaps this pest should be included in the EPPRD (Emergency Plant Pest Response Deed) rather than the EADRA (Emergency Animal Disease Response Deed).[12]

6.18 In its submission, AHBIC also argued that:

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10 Western Australian Beekeepers' Association, Submission no. 32, p. 15.

11 CSIRO, Submission no 33, p. 13.

12 CSIRO, Submission no 33, p. 13.

> There is a strong case for agriculture and horticulture industries to contribute to the prevention of a Varroa mite incursion and other bee diseases and pests. This is because it is these industries that are expected to experience significant losses if an incursion does occur.[13]

6.19 AHBIC recommended that 'all crop industries that derive an economic benefit from pollination services should contribute to exotic pest and disease cost sharing arrangements'.[14]

6.20 In his evidence before the committee, Dr Peter O'Brien, the Managing Director of RIRDC, noted that if pollination services rather than honey production were taken into account, the honey bee industry would attract much more research funding:

> If you looked across other sectors and their investments in research and development, under the current government model, the levy paying model, the government will match levies up to half a per cent of GVP. So typically you see industries that have a levy in place spending about one per cent of their GVP, sometimes a bit more, on research and development. If you wanted to use that as a benchmark and you said that the size of this sector, the pollination sector, is perhaps $2 billion as an estimate, then perhaps $20 million would be a relevant comparison for the amount of research and development you might see to make it consistent with other sectors.[15]

6.21 In its submission, AHBIC also argued for more generous treatment of voluntary contributions to research funding, stating:

> Another issue is that there is no provision in the current levy arrangements for Voluntary Contributions by industry to be recognised by the Australian Government and so attract matching funding for an approved project. Voluntary Contributions with Australian Government matching funding is recognised in horticulture and is a very valuable part of the Horticulture Australia Limited research and development portfolio. An offer from a major honey packer and marketer to fund research on the therapeutic qualities of honey to the value of $500 000 could not be matched with

13 AHBIC, Submission no. 56, p. 30.

14 AHBIC, Submission no. 56, p. 32.

15 Dr Peter O'Brien, RIRDC, *Transcript of Evidence*, 8 August 2007, p. 12.

> industry funds even though this project was consistent with the new research and development plan.[16]

6.22 This call was echoed by the Tasmanian Crop Pollination Association.[17]

6.23 The ability to place a levy on pollination services was also identified at the industry workshop held in March 2008. The background paper for the workshop noted:

> A levy on managed honeybee pollination services has the potential to provide a relatively direct source of funding and to levy potential beneficiaries of the investments of Pollination Australia—honeybee pollinators and pollination user industries. While the levy payment would fall on honeybee pollinators, part of the levy would be passed on to the pollination user industries as honeybee pollinators incorporate the levy into their pricing structure.
>
> In 2000 the honeybee industry approached the Australian Government to have a levy for R&D apply to pollination sales with the levy expenditure then matched by the Government. The Australian Government Solicitor argued against the proposal on the grounds that a pollination service is not an animal or plant product, but the provision of a service or a plant product.[18]

6.24 In evidence before the committee, Dr Max Whitten identified some $10 million per annum in funding for honey bee research:

> If we are talking about the sort of public investment and support by the industry, I think one could well argue for a program of something like up to $10 million a year, driven by, say, core funding of $4 million and supported by industry with leverage for the balance of that. An example which would give you some comparison is what has actually happened to the Cooperative Research Centre for Australian Weed Management in Australia. I am the government visitor for that centre so I know that situation quite well. You probably know that that CRC's bid to the government for support failed because the criteria related principally to the

16 AHBIC, Submission no. 56, pp. 55–56.

17 Tasmanian Crop Pollination Association, Submission no. 70, pp. 21–2.

18 RIRDC, Pollination Australia, background paper for industry workshop 18–19 March 2008, Canberra, p. 27.

> new criteria about economic returns, intellectual property and so on. The criteria disqualified effectively the Weeds CRC from bidding. They have now put to the government a new bid for an Australian Centre for Weed Research. I think that is an interesting model to look at, because the value of weeds in economic and environmental terms is about $4 billion, so we are talking about something of the same value.
>
> What is now being asked of the government for the weeds centre—and I think there is bipartisan interest in this—is something like $4 million each year over 10 years, and then supported by funds from groups such as the Grains Research and Development Corporation for nearly $1 million a year, bringing it up to about $10 million. The governance model has not been talked about, but it will not be like a CRC model, which I think is now top-heavy. A lot of the resources are currently devoted to governance, and it is too rigid a structure. The new weeds model is now moving away from that towards a much looser structure between those groups that benefit—the research providers and so on. So you have got a model on your doorstep to look at.[19]

Future research priorities

6.25 The evidence presented to the committee during the course of its inquiry identified a range of research needs associated with the honey bee industry and crop pollination. Much of the emphasis was placed on the need to enhance biosecurity through various avenues of research, although other issues, such as the development of new products and technical innovations were also highlighted. A range of research needs have been highlighted in earlier chapters.

6.26 Meeting the threat of Varroa is seen as the principal research priority. In its submission, CSIRO emphasised the need to create research and development strategies focussed on maintaining and enhancing pollination services in the face of imminent biosecurity threats:

> Any R&D strategy should consider three avenues of attack. First is to preserve *A. mellifera* as an effective pollinator of Australian crops. Second is to maximise the benefits of *A.*

19 Dr Max Whitten, *Transcript of Evidence*, 10 August 2007, p. 19.

> *mellifera* by developing the approaches that will enable it to be managed so as to gain its peak effectiveness as a crop pollinator. Third, reduce reliance on *A. mellifera,* by determining how best to utilise the benefits from native Australian pollinators.[20]

6.27 CSIRO identified a range of activities that could be considered to meet the biosecurity threats facing the honey bee industry. As Varroa is considered the greatest threat to the Australian industry, that is the area of most immediate need. Identifying the biological and genetic factors of susceptibility and resistance is crucial to combating Varroa:

> A critical issue is the current susceptibility of *A. mellifera* to varroa mite and a key to addressing this is to understand the mechanism which has enabled *V. destructor* to shift onto worker brood and thereby identify mechanisms for resistance. This knowledge, combined with our knowledge of the honey bee genome offers the prospect of identifying the genetic basis for resistance and developing the capacity to breed bees resistant to the mite thereby reducing the need for miticides and increasing the level of sustainability of hive management.[21]

6.28 Likewise, improving our knowledge of crop pollination—developing pollination strategies for particular crops under Australian conditions—to maximise output is also considered crucial:

> To what extent do different crops of significance currently rely on the free feral honey bee service? Such information would provide the basis for the development of a strategy aimed at developing the relationship between plant industries at risk from the loss of pollination services through the loss of feral bees and the providers of a managed pollination service. Central to this will be the knowledge of how best to use bees to provide managed pollination of a range of crops in Australia where this does not yet take place to any great extent.[22]

6.29 Research into bee genetics was seen by a number of those who gave evidence as an important avenue of research, both as a means of developing bees resistant to disease and improving productivity. In

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20 CSIRO, Submission no. 33, p. 15.

21 CSIRO, Submission no. 33, pp. 15–16.

22 CSIRO, Submission no. 33, p. 16.

his submission, Mr Neville Bradford, a Queensland beekeeper, observed that 'research into bee genetics is needed to provide bees that are better producers, more resistant to disease and result in a higher return for beekeepers'.[23] Likewise, in his submission, Mr Allan Baker, a Western Australian beekeeper, stated:

> The research into the industry needs to focus on genetic strains of honey bees with recessive genes to mites, virus and disease, also research into bee product analysis to highlight beneficial factors in honey bee products.[24]

6.30 In his submission, Mr Adrian Jones, a Queensland beekeeper, recommended research into bee genetics, including drones as well as queens.[25]

6.31 Mr Lloyd Hancock saw great prospects for improvements in bee breeding through the use of science and technology. He stated in his submission:

> Queen bee producers establish their reputations by the quality of their queens they produce. They rely on their own extensive experience and some provide mated queens via Artificial Insemination techniques.
>
> I think this is one of the areas in which developments in one area of science could be applied to another area and produce some very worth while results. If you think about it, in the last few years there has been incredible developments in science. Understanding gene technology, the ability to analyze DNA, in molecular biology, the ability to see via electron microscopes and a host of other technologies are but a few. Could not these developments be applied to the selection and breeding of queen bees and a better understanding of bee diseases, bee pests i.e. the small hive beetle, the Varroa mite. Due to funding and other priorities this work is being hampered in Qld.[26]

6.32 In evidence before the committee, Mr Linton Briggs highlighted the potential for genetic research to assist in the fight against Varroa. He told the committee:

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23 Mr Neville Bradford, Submission no. 43, p. 3.

24 Mr Allan Baker, Submission no. 53, p. 3.

25 Mr Adrian Jones, Submission no. 81, p. 5.

26 Mr Lloyd Hancock, Submission no. 50, p. 1.

> It is interesting that in the honey bee population of the world, whether it be here, Africa, Europe or elsewhere, there is a certain percentage of honey bees that carry within them an inherent behavioural characteristic known as hygienic behaviour, which is controlled by recessive genes and so it is very hard through breeding to fix it totally across a population at an elevated level. However, research that has been done so far shows that as soon as the 20 per cent or so of honey bees that have this particular characteristic detect within the nursery of the hive an ailment that is perhaps killing off their young, they will remove it and get that inoculant out of the hive. That is terrific because it is done biologically and without chemicals. In the case of varroa, people around the world are finding that this particular characteristic also carries with it the ability for honey bees to handle the varroa mite better than its contemporaries. So this is an exciting area of research.[27]

6.33 In its submission, the South Australian Government argued for the need for more scientific breeding and the establishment of rigorous genetic standards:

> The bulk of replacement queens for the honeybee industry (excluding Western Australia) are sourced from the eastern states (principally Queensland and New South Wales). In many instances, queen bee breeders do not actively measure or provide purchasers with data about the honey producing ability, temperament and hygienic behaviour (ie ability to detect and remove infected larva/pupa) of the queens supplied. Similarly, beekeepers do not provide reciprocal information to their queen bee breeders. Thus in the absence of standardised objective trait measurements, decisions on genetic selection are subjective and may not necessarily match customer requirements. Further, consideration should also be given to evaluating known overseas lines of varroa resistant *Apis mellifera* - both as a preventative measure for the Australian honeybee industry but also as a means of creating a market advantage for Australian package bees.[28]

6.34 Another key research area identified by CSIRO is improved diagnostics for bee pests and diseases. This would allow importation

27 Mr Linton Briggs, *Transcript of Evidence*, 25 July 2007, pp. 4–5.

28 Government of South Australia, Submission no. 73, p. 3.

of bees from the United States, and re-export of offspring, which is currently not possible due to poor diagnostics for Africanised bees.[29]

6.35 Bee nutrition has also been identified as an important area of research. In its submission, the Queensland Government stated:

> Hives can be depleted especially when the bees are very active e.g. when providing pollination services. Historically many beekeepers have relied on access to native eucalypts in State forests and other public lands for suitable high quality nectar and pollen to build up their hives. Declining access to public land plus prevailing drought means that alternative sources of protein will need to be found to maintain the viability of hives and, in the long term, the stability of the industry.[30]

6.36 Mr Neville Bradford also highlighted the importance of research into bee nutrition in his submission:

> Research into bee nutrition is an important step forward. As bees are being worked harder, travelling longer distances and producing honey from crops with low quality pollen, bee nutrition becomes an important part of maintaining the hive. Some crops pollinated by bees may also provide a sub-standard nutritional diet for bees and a supplement is needed.[31]

6.37 Mr Michael Leahy, a beekeeper from Southern New South Wales, also emphasised the importance of research into bee nutrition to help maintain hive health and strength for both honey production and paid pollination services.[32]

6.38 In their submission, Trevor and Marion Weatherhead argued for research of impacts of climate change on the Australian honey bee industry:

> One emerging area that will need research is the effect of climate change on the flowering patterns of trees. Also, there will need to be work done on how climate change will affect the nectar and pollen producing capabilities of these trees as

29 CSIRO, Submission no. 33, p. 16.

30 Queensland Government, Submission no. 25, p. 14.

31 Mr Neville Bradford, Submission no. 43, p. 3.

32 Mr Michael Leahy, Submission no. 61, p. 10.

> well as some of the crops that are worked by beekeepers e.g. canola.[33]

6.39 In his submission, Mr Don Keith also highlighted the potential impact of global warming and the need to address this issue now. He stated:

> Beekeepers have noted significant seasonal changes since 1990, marked by less rainfall and longer dry periods. In as much as this is caused by global warming and not by previously accepted weather cycles, it will force changes to the Australian bee industry …
>
> A likely change to Australian Agriculture through the projected reduction of water available for irrigation will be a transfer of water use from lower value crops to the more intensive horticultural crops. This likely change will continue the accelerating requirement for paid pollination services.[34]

6.40 He urged research into alternatives and strong support from government:

> The reductions in available moisture in Australia's traditional beekeeping areas caused by the lower rainfall and higher temperature effects of global warming appears to be reducing floral resources.
>
> Research is needed into the effects of global warming on Australian melliferous flora and the honey bee industry.
>
> A strategy to utilise flora in areas of Australia more favoured climatically by global warming could underpin industry viability. Currently there is almost no commercial beekeeping in Northern Australia, probably due to unique management challenges. For this strategy to evolve, two steps need to occur :
>
> 1. Evaluation of the melliferous potential of Northern Australia flora.
>
> 2. Research into successful management practices to cope with the difficulties presented by the dramatic wet and dry seasonal variations.
>
> The massive effect of global warming on Australian Agriculture and the Australian environment should be

33 Trevor and Marion Weatherhead, Submission no. 42, p. 14.

34 Mr Don Keith, Submission no. 26, p. 2.

> reflected by Australian Governments being at the forefront of action to reduce and reverse global warming.[35]

6.41 The need for a better understanding of the economic role of the honey bee industry in agriculture and forestry was also noted. In evidence before the committee, Mr Robin Thompson (Tasmanian Department of Primary Industries and Water) told the committee:

> We have seen in the course of this morning that there has been a fair bit of interdependency between the apiary industry, the agricultural industry and the forestry industry. We do not really have a good economic understanding of how the interdependency works. We do not know what would happen to the agricultural industry if bees decreased, stayed the same or increased in number. In respect of the relative values of the apiary and forestry industries, it is very easy on one level to say that a tree is worth X and the forestry is worth that. But often that is fairly superficial in that it does not take account of, if you like, the value-adding of the industry to agriculture. So perhaps there is some basic economic research which may be beneficial there.[36]

6.42 In his submission, Dr Whitten recommended:

> A new comprehensive economic study be conducted on the role and value of incidental and paid pollination for all horticultural crops and pastures that depend on insect pollination, and in particular, pollination provided by the introduced European Honeybee, *Apis mellifera*.[37]

6.43 In its submission, the South Australian Government, highlighted the need for ongoing data collection:

> Historically, industry data (particularly economic) has tended to only be consolidated in response to an issue. Consequently these reports (unlike technical research reports) have a limited life span due to the evolution of industry and/or economic conditions. A cost effective method for data capture could;
>
> - assist operators assess their profitability (relative to industry standards);

35 Mr Don Keith, Submission no. 26, pp. 5–6.

36 Mr Robin Thompson, Tasmanian Department of Primary Industries and Water, *Transcript of Evidence*, 3 September 2007, p. 37.

37 Dr Max Whitten, Submission no. 38, p. 2.

- allow prospective investors/entrants to assess the industry's productivity and opportunities; and
- provide objective data when developing policies.

A benchmarking program involving operations from all states and territories could contribute greatly to this. Computer based models that could be modified for this purpose already exist in many primary industries.[38]

6.44 The South Australian Government recommended implementing and maintaining a national honey bee industry benchmarking program involving all States and Territories; and that AHBIC coordinate the periodic distribution of benchmarked indicators to industry for information.[39]

6.45 The medicinal use of honey is seen as an important area of diversification for the industry as well as having significant benefits for society generally. In its submission, AHBIC noted:

> Due to the production of hydrogen peroxide, most raw honeys have anti-microbial properties. However Australian Jellybush honey is primarily used for its medicinal purposes as it has some as yet undiscovered property that provides extra antimicrobial activity. In 1997, Jellybush honey became the first and only honey registered as a therapeutic agent, which was made possible through research undertaken by RIRDC and Capilano. It comes from *Leptospermum* species, a native plant with small waxy flowers. Although this is one of the species that has antimicrobial activity, there exists other species within Australia that have medicinal use potential, including Jarrah honey from Western Australia. Other high anti-microbial active honeys are currently being researched.[40]

6.46 AHBIC saw great opportunities for the industry to diversify into the production of medicinal honey, but only if research funding was available to identify and test different honeys for their medicinal properties:

> There is a good possibility for honey producers to expand into the production of medicinal honey. Jellybush grows quickly, maturing at between two and three years old, and can be grown in a number of places within Australia.

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38 Government of South Australia, Submission no. 73, p. 3.

39 Government of South Australia, Submission no. 73, p. 3.

40 AHBIC, Submission no. 56, p. 20.

> Promotional efforts are currently being undertaken on the domestic and international health care markets to increase demand for medicinal honey. However, not all Jellybush trees can be used to produce medicinal honey, and the process of extraction can impact the level of anti-microbial activity. Further research into the properties that create active honey and the maintenance of its medicinal properties needs to be undertaken in order to continually develop this market.[41]

6.47 In its submission, the Department of Agriculture and Food, Western Australia, noted that a 'recent DAFWA project has shown that honey from the Jarrah forest has effective levels of antimicrobial activity and therefore there is an additional community health benefit associated with bees having access to forests'.[42] The submission continued:

> After extension of this information, Jarrah honey is now in high demand, and is one of the highest priced honey products in WA. Further efforts in marketing of this unique honey would contribute to the profitability and sustainability of the industry, and may encourage a younger group of people into the business. This all has a flow on beneficial effects for the agriculture and forestry sectors.[43]

6.48 In their submission, the Fewster family noted that 'ongoing research is required on the benefits of honey and propolis for medicinal purposes. There is not enough research and or facts on the benefits to humans and animals of honeybee products from the hive'.[44]

6.49 In evidence before the committee, Mr Lloyd Hancock proposed an even more adventurous approach to the investigation of the medicinal properties of honey—the detailed investigation of a range of potential uses based on traditional medicines. He explained:

> Honey, as we know, is a product going back to pre-biblical times. There have been many folk tales about the use of honey. I think it is only in recent times, with the advent of Medihoney, that modern science has confirmed the role and the ability of honey in traditional cures. Work was done here at the PA Hospital. In my submission I mentioned the ABC's *Catalyst* program. The point I make is that there are also other

41 AHBIC, Submission no. 56, p. 21.

42 Department of Agriculture and Food, Western Australia, Submission no. 24, p. 3.

43 Department of Agriculture and Food, Western Australia, Submission no. 24, p. 6.

44 Kuyan Apiaries & West Coast Honey, Submission no. 58, p. 8.

> areas that may be pursued, such as the use of honey in helping the body absorb calcium. This could have major benefits for people suffering from bone loss—osteoporosis. There is also mention of honey and cinnamon. I do not know whether these folk cures are correct or not, but they have been about for a long time and, to my mind, there should be some funding of research just to prove or disprove them.
>
> It may be that because bees forage on lots of different plant types, as was the situation with Medihoney, certain flowers will give you certain products. This happened in some research work done at the PA Hospital with emu oils, where the emus seemed to pick up certain things and this had effects for arthritis. This type of research does not attract funding because drug companies do not get anything out of it, but it could be of tremendous benefit. By the simple use of honey and things like cinnamon and calcium, great benefit could occur for patients, and I would strongly suggest that that is an area that should be recommended for funding.[45]

6.50 He also suggested other areas of technical innovation, such as using remote sensing techniques to monitor hives:

> The present method of looking after bees usually involves long trips to inspect and when the frames are ready for extraction they are returned to the extraction plant and then returned to the hives. This journeying and transporting frames back and forth adds costs to honey production. Some applied technologies are being tested whereby the hives are monitored remotely and information about the weight of the hive is sent back to base by mobile phone. With developments in technology it will be interesting to see if the advances in medical remote laparoscopy could be applied to examine the interior of a hive so regular inspections could be made on the activities of the queen, the presence of pests, the state of the hives. If techniques like these worked it could save costs of transport to the site, the time to dismantle the hive and would enable the presence of any unwanted or introduced pests to be detected earlier. That is between regular visits which could be weeks apart.[46]

6.51 Or developing mobile extraction plants:

45 Mr Lloyd Hancock, *Transcript of Evidence*, 10 August 2007, p. 79.

46 Mr Lloyd Hancock, Submission no. 50, p. 2.

> Extracting vans with facilities up to health standards which are capable of extracting honey near the hives would save costs of transporting full frames of honey to extracting plants and be returning extracted frames back to the hives. The concept of having "contract harvesters or honey extracting harvesters" is not viable at the moment but could be a future economic concept if the harvesting were linked to the honey packers. That is the beekeepers would pass the responsibility and costs of harvesting on to the packers. The packers would go to the field extract the honey, pay the beekeepers a price on honey extracted plus the by products, beeswax etc. The bee keeper would reduce their responsibilities simply to getting the best production out of the bees and develop other services such as supplying hive for pollination both locally and for export. Obviously in sites not suitable for the extracting vans the frames of honey would need to be transported a short distance to a site suitable for a van.[47]

Education and training

6.52 In the evidence presented to the committee, education and training was presented as a vital issue to the Australian honey bee industry, both in the sense that the industry required trained workers within and supporting the industry, but also in the sense of educating the general public as to the importance of the industry.

6.53 A critical issue facing the industry is the ageing of the workforce, the consequent threat to the industry's knowledge and skill base as beekeepers and research and extension staff retire, and the scarcity of young new entrants to the industry. In its submission to the inquiry, the Tasmanian Beekeepers' Association noted that:

> Beekeepers are an aging population with the estimated average age of Beekeepers being greater than 54 years, a number are in their 70's and 80's. Most beekeepers have no formal training yet the level of knowledge older beekeepers would certainly have earned them a PhD in academic circles. The Beekeeping industry has a vast unwritten cultural history. Pioneers in the industry have an intimate knowledge of the environment, and its impact on hive management.

47 Mr Lloyd Hancock, Submission no. 50, p. 2.

> A key cultural issue is the loss of industry knowledge and skills through an ageing population and no formal process to transfer these skills and knowledge. With less and less younger people entering the industry there is no mechanism to pass down this knowledge.
>
> Young people are not attracted to the beekeeping industry. This is not dissimilar to other agricultural industries. Specific reasons in the beekeeping industry are the high cost of setting up business, the heavy workload (especially during the summer season) and the lifestyle commitment that must be made.[48]

6.54 In her evidence, Mrs Goldsworthy also emphasised the need to harness the knowledge of industry elders and transmit it to a new generation. She stated:

> We really have to get on paper how we can, in a flexible way, deliver a pathway for either a new entrant or for an existing entrant to improve their skills in particular areas. It worries me greatly, when I surround myself with most of our suppliers and with industry people, that the average age is so high. I look at people like Linton Briggs and others within our industry—Paul Griffiths, whom I spent some time with yesterday; I could name many of them—and you know that somewhere in the next 20 years that knowledge and that skill is not going to be there. My education has been more about finding mentors within our industry whom I have been able to get on the end of the phone and ring and say: 'Hey, I've got this particular problem. Give me the background on that; give me the history on that. Why did we as an industry reach this particular point?' There is a lot of knowledge out there that I am very conscious has to be captured urgently, because there is not the younger people coming in to do that.
>
> I have been giving this a lot of thought and I suspect that it would be terrific if in some way we were able to partner younger people who are interested, whether they be amateurs who are interested in becoming more commercial or others, with some of our older generation beekeepers, many of whom are looking for exit strategies from the industry. That would be one way to come up with a model that may assist in bringing new people into the industry. They may not be 18-

48 Tasmanian Beekeepers' Association, Submission no. 63, pp. 5–6.

> year-olds, but they might be 35-year-olds who have tried something else, are ready to leave the corporate world, have been interested in bees for a period of time and who might want to work alongside some of these more experienced industry members.[49]

6.55 However, as noted by a number of beekeepers, learning the art of beekeeping, and doing the work required to make a success of it, is hard. In his submission, Mr Michael Leahy, a first generation beekeeper, stated:

> I cannot find anybody in Australia who is skilled and wants to work in the industry nor somebody who wishes to train to become a beekeeper.
>
> It is a tough profession, you need to be skilled in so many areas: Manipulation of hives of bees, queen bee breeding, truck driving, machine/plant operator, maintenance engineer, forester—identifying trees, flowering habits, accountant and office administrator and the list goes on.
>
> I admit that the path as a first generation beekeeper with no grounding whatsoever has been difficult. Certainly without the support of certain people…I wouldn't have made it. And so maybe there needs to be a better way.
>
> How you go about this is difficult as firstly you need to collect information of the right people. Secondly, you need the right people to teach it.
>
> At the end of the day you can teach people to go through a hive of bees, how to take honey off and how to load a truck, possibly even to find the occasional honey flow, extract honey and recognise different varieties. But at the end of the day the most successful beekeepers have a gift as does a Picasso.[50]

6.56 In evidence before the committee, Mr Des Cannon also highlighted the length of time it took to acquire the necessary knowledge and skills required to become a commercial beekeeper:

> One of the hard parts about becoming a commercial beekeeper is that I was told very early that it was a 15-year apprenticeship because it takes about 15 years to build up your botanical knowledge, to build up your biological

49 Mrs Jodie Goldsworthy, *Transcript of Evidence*, 25 July 2007, p. 55.

50 Mr Michael Leahy, Submission no. 61, pp. 11–12.

> knowledge of how to get the best out of the bees and to build up your repertoire of sites that you can go to. I would say that is a fairly accurate summation—about 15 years to really get to the point where you can succeed.[51]

6.57 In his evidence, Mr Roy Barnes, a Queensland beekeeper, stated:

> Regarding the education of beekeepers, I think I might have mentioned in my submission that it is fairly easy to train people in how to manage a beehive but it is virtually impossible to teach them how to read the bush without those practical, hands-on years of experience. I have been beekeeping for 44 years, since I left school, and I have not seen one season that has been exactly the same as another. It is an ongoing challenge each year because each year is different. At the beginning of the year I cannot plan out where my bees are going to be for the next six months. There are so many varying factors that come into play, and you change, on a day-by-day basis, which way you are heading. That is just the nature of the game.[52]

6.58 One of the keys to industry renewal cited in the evidence presented to the committee was attracting young people in. In his submission, Mr David Leyland, a Western Australian beekeeper, highlighted the need to attract young people to the industry:

> It is my opinion that the greatest dilemma the industry currently has is how to entice younger people in. Our industry mainly consists of generations of older beekeepers that do not have a following of children that are interested in continuing in beekeeping. It does not offer attractive enough monetary returns for the great amount of effort and labour involved.
>
> The wider community is not educated enough on beekeeping to know that it is a viable choice for a career. There is no official educational program to assist any potential newcomers to the industry.[53]

6.59 One solution was to put apiculture into schools. In his submission, Mr J F Ward, a beekeeper from Victoria, argued strongly for teaching apiculture in schools, stating:

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51 Mr Des Cannon, *Transcript of Evidence*, 8 August 2007, p. 19.

52 Mr Roy Barnes, *Transcript of Evidence*, 10 August 2007, p. 65.

53 Mr David Leyland, Submission no. 3, p. 1.

> The time is coming when more young people will be needed for this industry, most apiarists are an ageing lot. The Government needs to have apiculture taught in schools.[54]

6.60 Mr Neville Bradford noted the barriers to bringing bees into school education, but also emphasised the need for teaching children about the role of bees and agriculture generally:

> On the subject of education, a few things used to happen. In the past, most schools had a project club and that project club usually had a beehive and they would gather the honey and sell the honey off as a money-earner. Those beehives are gone because that sort of thing is not seen as being a terribly safe activity to have at a school. The flow-on effect of that is that fewer people becoming interested in bees.
>
> On that same tack, where bees are not seen as a safe thing for schools, some schools which have rural studies, where they learn about different rural industries, are having difficulty in that they are not allowed to keep hives for rural subjects. In some towns they are banned from keeping the hives there.
>
> There is a lack of funding and a lack of availability of rural subjects to secondary students, so there is nothing for them to see what other options are out there, other than working in an office or taking on a trade or something like that. There is nothing there to show them what rural life is about and what could be expected from it.[55]

6.61 Mr George Pallot, President of the Ipswich and West Moreton Beekeepers Association, highlighted the successes and frustrations his association had encountered in bringing apiculture to schools:

> We are quite active as an association in the school area. Several of our members have been very active in one of the large colleges in the Ipswich area. As I said in our submission, the beekeeping section there is very successful in submitting honey to shows and so forth and winning prizes. We have been very prominent in that area. Several of our members have gone along to schools to give talks on bees. On top of that, just prior to Christmas I went around to 20 or 30 schools in the Ipswich area, distributing books for inclusion in their libraries. The feedback from that was very positive, but it was

54 Mr J F Ward, Submission no. 4, p. 1.

55 Mr Neville Bradford, *Transcript of Evidence*, 10 August 2007, pp. 53–4.

> very disappointing to hear from the personnel in these schools that 'Beekeeping does not feature in our education system.'[56]

6.62 Another important area highlighted in the evidence was the need for public education about the role of honey bees. In its submission, the NSW Apiarists' Association stated:

> Education of the general public is perhaps as important as training young beekeepers. Both the community and Government need to be made aware of the value of the honey bee to society.[57]

6.63 In a similar vein, Mr Pallot noted:

> I have outlined here, on behalf of the association, three aspects of education, and one of them certainly is education of the public at large as to—the term we were using earlier on—the clean green image of Australian honey and its advantages, and that the producer of that honey is also a valuable part of the ecosystem of the country. This, again, is part of what I said earlier on about the frustration of the small beekeeper about the lack of knowledge out there in the marketplace.[58]

6.64 In her submission, Mrs Papworth, also highlighted the need for public education:

> Education of the general public is perhaps as important as training young beekeepers. The everyday man on the street should be made aware of the value of the honey bee to society and the wider community.[59]

6.65 Mr Trevor Monson observed the need for public and formal education, recommending:

> That all agricultural sectors, and the general public, are educated on the value and importance of the beekeeping industry and that an applicable beekeeping module be included in all agricultural courses.[60]

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56 Mr George Pallot, *Transcript of Evidence*, 10 August 2007, p. 71.
57 NSW Apiarists' Association, Submission no. 65, p. 4.
58 Mr George Pallot, *Transcript of Evidence*, 10 August 2007, p. 71.
59 Mrs Elwyne Papworth, Submission no. 74, p. 8.
60 Mr Trevor Monson, Submission no. 6, p. 3.

6.66 Mr Don Keith urged the reintroduction of apiculture courses in agricultural education:

> The demise of apiculture courses throughout the nation due largely to the small number of specialist employment opportunities has left a hole in the transfer of knowledge to people who will be needed to continue to manage the industry, pollination and the research required for success.
>
> *Resolution of this great need would be an important outcome for this Inquiry.*[61]

Formal training

6.67 In the evidence presented to the committee it became apparent that establishing a formal training regime was both urgent and extremely difficult. In evidence before the committee, Dr Ben McKee, of Capilano Honey Limited, explained:

> We need a national training opportunity for new entrants. That is a worry for us. Although we have a surplus crop, we need to keep up the volume of beekeepers coming through, and there is a threat to the industry at the moment with the age of current entrants and new entrants requiring a skills upgrade and so on. More of a concern for Capilano is the need to conserve the knowledge and skills of current participants for future generations.
>
> It is very hard to learn from a book how to be a beekeeper. To be able to do it in a manner which is profitable takes direct contact and quite a long association with someone who has the skills and knowledge. It is something that is really hard to pass on from an educational point of view.[62]

6.68 In her evidence before the committee, Mrs Goldsworthy, identified similar issues, and expressed frustration at how little progress had been made despite the development of competency standards for industry training:

> Education for this industry has a whole range of unique challenges—the size of the industry and the geographic spread of the industry being just two of those issues. As for the location, I am looking forward enough to say, 'I don't care

61 Mr Don Keith, Submission no. 26, p. 5.

62 Dr Ben McKee, *Transcript of Evidence*, 10 August 2007, p. 3.

> where it exists as long as it exists somewhere.' I will not make a comment about where exactly it should be located. I personally have not come through any of those educational institutions of the past. I have been involved, through the Australian Honeybee Industry Council, with setting up and developing, with industry, the national competency standards. It has been very disappointing to see that, after the few years of that hard work to get those competency standards written, the uptake by agricultural TAFE colleges has virtually been zero. I guess that is because it is hard enough to get those colleges to run agricultural or farming programs in general, let alone something as specialist as apiculture.[63]

6.69 AHBIC also addressed the questioned of training in its submission. Its solution to issues of low numbers and high dispersion was to concentrate training into the hands of a single provider. This would require changes to the administration and funding of training arrangements which currently are administered and funded on a state-by-state basis:

> The industry has recently had a range of competencies endorsed by the Department of Education, Science, and Tourism for the delivery of training to its members. As the industry is dispersed right across Australia, the industry believes that there will be problems getting a critical mass of trainees together for specialised training. While a lot of the training will be based in the workplace there will be a need for trainees to interact with industry specialists and experts.
>
> It is the industry's preferred model to have a designated Registered Training Organisation (RTO), which the industry would support in delivering the traineeship. This RTO would run specialist courses at the most appropriate location and have trainees attend from across Australia. It is the industry's understanding that trainees are fully based on state delivery and it is very difficult if not impossible to enrol trainees from interstate and have them attend a RTO.
>
> This is a real impediment to the up-skilling of the honeybee industry for future changes that are likely to affect it. It is therefore suggested that institutional arrangements be put in place for a Commonwealth traineeship to be run that would

63 Mrs Jodie Goldsworthy, *Transcript of Evidence*, 25 July 2007, p. 55.

> enable trainees to attend their training anywhere in the country. The traditional travel support and other arrangements for trainees would therefore be available to these trainees to attend the training.
>
> The industry believes that the current state-by-state arrangements are unnecessarily bureaucratic, and from experience in other industries it seems that they are a real impediment to small industries like the Australian honeybee industry to have a critical mass of trainees for specialised training.[64]

6.70 AHBIC recommended that:

> Institutional arrangements should be put in place for a Commonwealth traineeship that would allow trainees within the honeybee industry to attend training anywhere in the country.[65]

6.71 Centralised training or a national industry training centre was advocated by others in the industry. In their submission, Messrs Frank Malfroy, Tim Malfroy and Lewin Goodwin-Brickhill, beekeepers, stated:

> A training and research centre would help to increase the knowledge of existing beekeepers and provide a focal point for attracting newcomers to the industry. The Honeybee industry needs to attract a younger workforce to address the ageing beekeeper population. This could be provided as an additional component to various Agricultural and Horticultural degrees throughout Australia. A similar unit could be available at TAFE colleges. This facility should be encouraged at these institutions as a way of achieving a younger workforce for the future development of the Australian Honeybee Industry. At present there is no training provided at any tertiary institution.[66]

6.72 Capilano Honey Limited argued that a 'formal standardised and national education program be implemented to assist new

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64 AHBIC, Submission no. 56, pp. 57–8.

65 AHBIC, Submission no. 56, p. 58.

66 Messrs Frank Malfroy, Tim Malfroy and Lewin Goodwin-Brickhill, Submission no. 35, p. 1.

participants to the industry and to ensure a mechanism exists for the update of skills for existing members'.[67]

6.73 The Amateur Beekeepers Society of South Australia urged the establishment of a 'Centre of Excellence' for industry training, with components such as marketing, financial management, disease management and queen bee breeding, providing the necessary skills for the future leaders of the industry. The centre would provide skills which are transferable between states and complement other agricultural and horticultural industries.[68]

6.74 In his submission, Mr Trevor Monson identified the work of the NSW DPI in developing an apiculture curriculum, and the need for a new training funding model to make it work:

> In recent times the NSW Department of Primary Industry have developed a curriculum to train apprentices in beekeeping. So now an education framework exists and is possible. However, because of the low demand and/or numbers involved, it would be more practical if students from around Australia were able to train at one institution. This would mean that funding arrangements may need to be modified so that students from various states would be funded and allowed to attend an institution out of their home state. At the moment, there may be only one or two apprentices wanting to be trained in a particular state. It wouldn't be practical or economically viable to run such a small class, so they would be turned away.
>
> I would like to suggest that the Tocal Agricultural Centre at Paterson NSW be considered as a possible training centre for beekeeping apprentices. It is near a major airport and has accommodation. So, if training were to happen in the winter off-season, there may be a class of 10–15 students.[69]

6.75 The NSW Government also highlighted the need for a new training funding model in its submission, stating:

> As the honey bee industry is widely dispersed across Australia there are problems achieving the critical mass of trainees required to run specialised industry training. The industry's preferred model is to work with a designated

67 Capilano Honey Limited, Submission no. 55, p. 7.

68 Amateur Beekeepers Society of South Australia, Submission no. 19, p. 4.

69 Mr Trevor Monson, Submission no. 6, p. 6.

> Registered Training Organisation (RTO) to deliver the training it needs to meet future industry opportunities and changes. This RTO would run specialist courses at the most appropriate location and have trainees attend from across Australia.
>
> Current State-by-State arrangements do not reflect this model. While industry has recently developed its own competency standards through the Rural Training Authority, vocational training packages have not been developed, impeding the uptake of industry based training. It is recommended that the Commonwealth should implement a traineeship system that reflects industry needs by enabling trainees to attend their training anywhere in the country.[70]

6.76 Mr Ken Gell, President of the Victorian Apiarists' Association, pointed to the need for industry specific training:

> It upsets industry people when they have to train for things which are probably not needed in their industry. For example, here in Victoria we have to do a course on one of the chemicals we use to treat wax moth. We have to learn how to calibrate the nozzles on sprays— which we never use—for use on a broadacre farm. They are very hesitant to set up a course specifically for our use only. That frustrates our industry no end. We need a course for only our industry but they do not want to do it. They want a blanket course which suits everyone but it does not involve chemicals that are used in our industry. That example probably shows that we need a little bit of help to make sure that the courses are designated for our industry.[71]

6.77 The lack of formal education in apiculture has broader implications for the industry in terms of a decline of expertise in research and extension. In evidence before the committee, Mr Gavin Jamieson highlighted deficiencies in knowledge and training and their impact on extension:

> As I expressed in my submission to you, I believe there are virtually no undergraduate courses in any university in Victoria that teach basic apiculture. Your previous report, as I understood it—and I have a copy of the report produced for

70 NSW Government, Submission no. 79, pp. 9–10.

71 Mr Ken Gell, *Transcript of Evidence*, 25 July 2007, p. 6.

> the parliament—dealt with the beekeeper industry, not academia who deal with the beekeepers. We do not have in Victoria any extension officer employed as a consultant or in any other capacity who knows about beekeeping. If you are a beef farmer or a grain grower, you have someone who is trained in the extension and to help you make money and who, wisely and in a sustainable way, manages the resource that you are farming. In beekeeping all we have, in the main across Australia, are disease experts who talk about how we shall deal with the disease once we get it, not how we manage our resource in a sustainable and an economic way. In educational terms, that is something that I suspect the previous inquiry did not necessarily grasp.[72]

6.78 In its submission, the Centre for Plant & Food Science at the University of Western Sydney identified problems with providing undergraduate training in apiculture:

> Until 2005, UWS has offered courses in Apiculture, primarily for undergraduate students in Diploma, Associate Diploma and Bachelors courses. Apiculture was a popular elective amongst students undertaking Bachelors degrees in horticulture and agriculture. The apiculture course was based on honeybee *(Apis mellifera)* management, but also provided tuition in crop pollination and native bees. As such, it provided fundamental requirements for students subsequently undertaking careers in the beekeeping industry as well as in crop production.
>
> However, apiculture ceased to be offered at UWS in 2005, following major course rationalisation in undergraduate and postgraduate courses. Numbers of students in apiculture fell to below 16 (the cut-off enrolment required for elective offerings), primarily a result of declining undergraduate enrolments in the agriculture and horticulture courses.[73]

6.79 In its submission, the Department of Agriculture and Food, Western Australia, noted the lack of succession planning in the area of research and development, and the lack of funding for scientific training and research:

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72 Mr Gavin Jamieson, *Transcript of Evidence*, 25 July 2007, p. 30.

73 Centre for Plant & Food Science, University of Western Sydney, Submission no. 90, pp. 1–2.

> There are about five researchers who study honeybees in a full time capacity throughout Australia. A number of other researchers carry out projects involving honeybees but these are outside of their normal research focus. Training of people for future honeybee researchers is largely non-existent. It can take up to 5 years postgraduate work for any researcher on the subject of honey bees to become efficient in understanding and managing the complex and behavioural and social system. Most of the current researchers are aged 50 years or more and in 10 to 15 years will be retiring. Adequate research support by way of salaries and operational expenses need to be provided to ensure ongoing R&D in the apiculture industry. Joint ventures between federal and state Departments of Agriculture and the apiculture industry could be explored.[74]

6.80 The same problem was identified by the South Australian Apiarists' Association, which noted that 'most of our apiary industry researchers are within 10 years of retirement and we need to attract some younger people into this area to continue research into the future'.[75]

Extension

6.81 Alongside research and training, the provision of extension services was seen as a vital issue for the Australian honey bee industry. Many in the industry believe that extension services are in terminal decline. In evidence before the committee, Mr Linton Briggs stated:

> Over recent years, several decades now, we have seen gradually a wastage of people from respective state departments that service this industry, to a point where some of the states are running very close to the bone as far as extension people and apiary officers are concerned. These people really could have a very important role to play in bridging the needs of this industry with the needs of the agricultural and horticultural industries.[76]

6.82 In his submission, Mr Peter McDonald, a Victorian beekeeper, stated:

74 Department of Agriculture and Food, Western Australia, Submission no. 24, p. 5.

75 South Australian Apiarists' Association, Submission no. 7, pp. 2, 4.

76 Mr Linton Briggs, *Transcript of Evidence*, 25 July 2007, p. 5.

> Over the years much has been provided to the beekeeping industry in Victoria through the DPI. Staff numbers who provide support, research, inspection and other services has gradually declined through positions not being filled when they become vacant. Hence much needed assistance has been gradually eroded. Full time inspectors have become multi-tasked part-timers who also look after other industries. This erosion should stop and be reversed. Extra funding for the DPI should be granted to allow these support services for our small but integral industry to return to what they once were.[77]

6.83 Even in New South Wales, where the Government explained that the 'NSW Department of Primary Industries (NSW DPI) has 19 gazetted apiary inspectors, with 17 of these available to carry out apiary inspections in the field',[78] there was concern expressed by the NSW Apiarists' that State DPI budgets have reduced the number of dedicated Honey Bee Industry staff (extension, regulatory) in recent years, disadvantaging the Honey Bee Industry'.[79]

6.84 In its submission, the Geelong Beekeepers Club expressed concern that the decline in extension services left the industry open to biosecurity threats:

> It is very sad to see the gradual demise of Victorian government infrastructure In the Beekeeping Industry. The Victorian government just does not invest enough money into Apiary Inspectors, and Research staff. If an outbreak of Varroa or Tracheal mites were to occur in Victoria we would be sorely understaffed. For Example when Fireblight was introduced into the Melbourne botanical gardens it was a major job to find and kill the 40 feral hives, and this did not include the adjoining suburbs where hives would also have been found.[80]

National research and training centre

6.85 The need for a more efficient training model for the industry has been highlighted in evidence before the committee. A centralised model for

77 Mr Peter McDonald, Submission no. 45, p. 4.
78 NSW Government, Submission no. 79, p. 5.
79 NSW Apiarists' Association, Submission no. 65, p. 4.
80 Geelong Beekeepers Club, Submission no. 64, p. 1.

training and research has also been discussed in the evidence presented. In his submission, Mr John Rhodes, a beekeeper, researcher and extension officer from New South Wales, argued for the establishment of a national research centre:

> The Australian Government could assist the beekeeping industry by providing a funding grant sufficient for the establishment and early operational costs to finance infrastructure and development costs of a honey bee research centre concentrating in the areas of research, education and bee breeding. The Australian beekeeping industry is small in size and would find it difficult to meet such costs without external assistance.[81]

6.86 He argued:

> A research centre would provide economic efficiency by allowing persons involved in bee research to operate as a group with the combined use of facilities such as laboratories and research apiaries which are expensive to maintain by individual researchers but necessary for most research programs
>
> A tertiary institute would provide a suitable base for a honey bee research centre by providing the educational profile required by persons involved in research, extension and education for the successful continuation and development of the beekeeping industry.[82]

6.87 In its submission, the Western Australian Beekeepers' Association observed that bee breeding would be best served by a national research centre, drawing together resources and skills:

> Bee breeding is a highly skilled undertaking, requiring the management of large numbers of hives, in addition to well developed technical skills and laboratory resources. An undertaking of this nature is best handled by an academic institution in collaboration with the industry. The industry would be far better served by a well resourced institutional approach to bee breeding, which has the capability to research, as well as select for, and reproduce, breeding stock

81 Mr John Rhodes, Submission no. 18, p. 1.

82 Mr John Rhodes, Submission no. 18, p. 1.

> which is resistant to the major diseases and pests currently threatening our industry.[83]

6.88 In her submission, Ms Gretchen Wheen, a beekeeper and researcher of long standing in the industry, also emphasised the need for effective funding and a proper institutional framework to underpin the vital task of genetic research and bee breeding. She stated:

> …there needs to be a much greater understanding and input into bee breeding from researchers, beekeeping personnel and the farming community at large. The present handful of competent people scattered throughout the country cannot sustain what is becoming not just a hobby/personal interest type occupation of disparate beekeepers, but a necessary modern highly technical occupation.
>
> A sufficient basic workforce is needed, centred in one place led by world class operators so that a body of knowledge can build. Without this the beekeeping industry will die and with it much of the agricultural and horticultural industries.
>
> As there are few in the field of bee breeding that have sufficient training and experience in the skills of insemination, queen and drone rearing and care, maintenance of breeding lines and populations, collection and analysis of data, a first class enterprise cannot at present be achieved.[84]

6.89 She highlighted the benefits of such investment both to the industry and the nation:

> If bee breeding is strengthened through a world class entity there is good potential both within Australia and overseas for both products and services. Importantly, facilitated through a best practice national program, the systematic genetic improvement of honey bees, not only for apiary productivity will accrue, but the development of honey bees with elevated biological resistance to diseases and pests, including Varroa, will benefit food production from these crops in horticulture and agriculture that require insect pollination to fertilize crops and maximise yields. In a few short words, the nation and its people will benefit.[85]

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83 Western Australian Beekeepers' Association, Submission no. 32, pp. 16–17.

84 Ms Gretchen Wheen, Submission no. 17, p. 1.

85 Ms Gretchen Wheen, Submission no. 17, p. 2.

6.90 Mr Lindsay Bourke, President of the Tasmanian Crop Pollination Association, spoke in support of a national training centre for the industry in his evidence before the committee:

> Our submission also talked about not having people to help the ageing beekeeping population to carry on their business. That is true. This year, I am trying to get a Korean person to come over. Other beekeepers in the state get beekeepers from the Philippines and Europe. We cannot get people from within our own country to help us harvest our crop and to do pollinating. That is why we really need something like what we had in the past at the Hawkesbury College. Waikato University have put in a pretty good submission to AHBIC, and they look like the forerunner to provide a national education facility for us. But one of the problems would be shipping young beekeepers around the country to this college. That would be at a cost. We need to do that. We cannot have it in different centres. We need to have a centre of excellence where we can train people to carry on our business.[86]

6.91 On the other hand, Mr Peter McDonald, Victorian beekeeper, urged a decentralised model for research and training:

> In order to provide better research and development for the industry, I think we need distributed research facilities throughout Australia, managed through a central research organization such as the RIRDC. They should be linked with Universities, CSIRO & DPI research institutes in both regional and metropolitan centres in either all, or at least the majority of the states and territories of Australia. I feel it should be a distributed structure as there are many differences in beekeeping throughout the different regions of Australia and hence many current resources, (beekeepers, DPI Apiary Inspectors and Extension staff) that could provide expertise & resources on local issues. A centralised model would tend towards local expertise where it is setup to support the research, which may not provide the best results for all Australian beekeeping.[87]

86 Mr Lindsay Bourke, *Transcript of Evidence*, 3 September 2007, p. 13.

87 Mr Peter McDonald, Submission no. 45, pp. 4–5.

6.92 In its submission, the Centre for Plant & Food Science at the University of Western Sydney identified a potential role for the University in a future national research program:

> University of Western Sydney envisages that it will play an increasing role in research and training at a university level (undergraduate and postgraduate) in apiculture and crop pollination, particularly for future industry leaders and international students. The future of the Australian honeybee industry, as with other primary industries, will be best served by well-qualified participants. While the research work will explore fundamental scientific issues, it will remain focussed on practical outcomes for the Australian (and international) apicultural and crop production industries.
>
> We also see UWS taking the major role in postgraduate training and research in pollination of horticultural crops, including by non-Apis species and native bee biology and pollination in Australia.[88]

6.93 However, the submission also noted the need for adequate and secure funding if a national centre based at the University was to be viable—funding was required for academic positions:

> Pragmatically, this heightened profile and activity would require the appointment of a senior academic (at least at the level of Senior Lecturer) or even a Professorial Chair in Crop Pollination to UWS to develop carry out these activities. Currently, in the absence of a specialist apiculturist, Associate Professor Robert Spooner-Hart has been principal supervisor of apiculture students at UWS. However, Professor Spooner-Hart is reaching retirement age, and is likely to retire within the next 3–4 years. As outlined above, in the current funding climate, UWS would be unlikely to make a new academic appointment in apiculture/pollination unless there was some guarantee of medium-term funding support for the position, either via adequate student enrolments, external research funding, industry support or a combination of these. The latter could be achieved by direct external funding of the position, via partial funding or subsidy.[89]

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88 Centre for Plant & Food Science, University of Western Sydney, Submission no. 90, pp. 4–5.

89 Centre for Plant & Food Science, University of Western Sydney, Submission no. 90, pp. 5–6

6.94 The precise model for a national centre was the subject of some discussion. In evidence before the committee, Mr Stephen Ware of AHBIC downplayed the need for a bricks and mortar institution:

> The centre itself, if it were a bricks and mortar type university, would be expensive and we do not think that is the way to go in the longer term. There was evidence to suggest before it was disbanded that something like the weed CRC was a way of getting more researchers online and delivering services better.[90]

6.95 In evidence before the committee, Dr Max Whitten highlighted the need for a national research centre to provide the industry with a critical mass for research and training:

> With this model that we are talking about under this new industry group—say we call it 'Pollination Australia'—the research structure that you would put in place would be one based on a cooperative arrangement funded or managed through the Rural Industries R&D Corporation. You would then drag in researchers and teachers from across this country into a pollination industry network, having a visible centre which would replace the existing quarantine facility, but add to it a biotechnology research capability which would then allow researchers to come to do specific research. It would also be used for training. It would reach out across the research and the training industries of Australia. I think that is where this inquiry can go.[91]

6.96 In its report, *Skills: Rural Australia's Need*, the Standing Committee on Agriculture, Fisheries and Forestry recommended 'the establishment of a CRC-style entity for beekeeping and pollination'.[92] However, DAFF noted in evidence submitted to the inquiry that the Government's response awaited the outcome of the Pollination Australia project:

> The Government is considering its response to the House of Representatives Inquiry into rural skills training and research, including the recommendation that it establish a Cooperative

90 Mr Stephen Ware, Executive Director, AHBIC, *Transcript of Evidence*, 15 August 2007, p. 7.

91 Dr Max Whitten, *Transcript of Evidence*, 10 August 2007, p. 20.

92 House of Representatives Standing Committee on Agriculture, Fisheries and Forestry, *Skills: Rural Australia's Need*, Parliament of Australia, February 2007, p. 149.

> Research Centre-like entity to work on research, education and bee breeding for beekeeping and pollination.
>
> However, the Honeybee Industry Linkages Workshop (23-24 April 2007) resulted in a commitment to form a strong alliance between the honey bee industry, research bodies and all industries that have a stake in pollination. The Pollination Industry Alliance will identify priority areas for research as well as opportunities for research to be funded through existing Rural Research and Development Corporations (such as those in horticulture or forestry), as well as RIRDC, for collaborative projects addressing research needs across all industries with a stake in pollination.[93]

6.97 In evidence before the committee, Ms Margie Thomson of RIRDC advised on the progress being made and the outcome envisaged through the Pollination Australia project:

> The commitment of support is there. It is key in ensuring that we are able to continue to drive this process forward. There needs to be a model to enable the research institutions and the industries to be brought together. That is what we are hoping to do from working through the key outcomes of the workshop and delivering that business plan. It will develop an R&D plan for the pollination industries, or those that are impacted by pollination, down to project level. It will give an indication of what type of model is necessary and how financial contributions can be provided. But this is a big issue. We know that the impact of varroa will impact on the price of foodstuffs that are available in Australia and the consumer will be paying a lower cost if we can really push through a very strong R&D program as quickly as possible. So the spillover benefits are significant. We are talking about $4 to $6 billion industries in Australian agriculture that will be affected by varroa mite.[94]

Committee conclusions

6.98 It is the committee's view that the provision of effective and efficient research, training and extension services to the Australian honey bee industry and the pollination industries sector is vital to the future of

93 DAFF, Submission no. 82, p. 7.

94 Ms Margie Thomson, RIRDC, *Transcript of Evidence*, 8 August 2007, pp. 5–6.

both. The committee notes that the report of its predecessor, *Skills: Rural Australia's Need*, made recommendations concerning the research, extension and training needs of rural industries of direct relevance to its current inquiry, especially in terms of increased funding and capacity, greater administrative and regulatory flexibility, and broad recognition of industry needs.

6.99 The committee believes that increased research funding is essential. The range of research needed to protect and enhance the capacity of both the honey bee industry and pollination dependent industries, especially faced with the imminent threat of Varroa, requires a massive increase in research effort to complement increased biosecurity measures. This in turn requires a substantial increase in available funding. The committee notes the work conducted under the auspices of the Pollination Australia project which identifies some $4.5 million in research projects which could be undertaken immediately. It also notes the work of the CSIRO in highlighting the economic benefits of keeping Varroa out—that some $50 million per annum in research and biosecurity measures could be justified on this task alone.

6.100 It is therefore, the view of the committee, that the Australian Government should commit itself to funding a major research effort in support of the honey bee industry, as recommended in Chapter 4 (Recommendation 17).

6.101 The committee broadly supports the research priorities outlined in the RIRDC research and development plan, which is in line with much of the other evidence received by the committee. Research on biosecurity; resource security (including the environmental impact of bees); bee breeding, genetics and diagnostics; bee nutrition (important for delivery of pollination services); and production efficiency within the honey bee industry, are all important. So to is research into the medicinal use of honey. Equally, however, weight must be given to research into pollination itself—the most efficient methods for pollinating of individual crops; the impact of agricultural chemicals on bees; and the practicality of using alternative pollinators and pollination methods to maintain or increase productivity.

6.102 The committee is also supportive of a more structured and centralised system of training and extension. This is essential to provide a critical mass of services to a small and highly dispersed industry. It is important, however, that such a centralised system be adaptive and flexible to take account of the wide variation in climate and vegetation

upon which the honey bee industries and pollination industries depend.

6.103 Creating a national centre for honey bee industry research, training and extension would appear to be the logical solution to these problems. The combination of existing facilities and critical mass makes a centre structured around the quarantine facility and the research activities undertaken at the University of Western Sydney the most viable option. The committee believes an administrative framework more durable than the current CRC model is essential to the long term success of a national centre. It may be that initially such an entity could be managed under the auspices of RIRDC, which manages the current research program, while eventually coming under the control of a new Pollination Industry Research and Development Corporation. This would also match an eventual transition from government to industry funding for research, development, extension and training.

6.104 Facilitating industry contributions to research funding is also important. The committee endorses the call for voluntary contributions to research funding to be matched by government, and for a levy on pollination services to be allowed under law. These measures would make a significant contribution to research funding even under current arrangements.

Recommendation 24

6.105 **The Committee recommends that the Australian Government establish a national centre for honey bee and pollination industry research, training and extension, funded as per Recommendation 16.**

Recommendation 25

6.106 **The Committee recommends that the Australian Government alter research funding arrangements to allow for:**

- **voluntary contributions to research funding to be matched by government funding; and**
- **a levy on pollination services to be allowed under law.**

The Hon Dick Adams MP

Committee Chair

26 May 2008