

National Herbalist Association of Australia



Founded in 1920

Medicinal Plants for the Future – Sustainability and Ethical Issues

A conference addressing possible threats
to the future supply of plant material
for medicinal use

Organised with the cooperation of

TRAFFIC
— OCEANIA —



IUCN
The World Conservation Union

Proceedings
13 –14 August 1999
Byron Bay
New South Wales
Australia

PROCEEDINGS

Of the

**MEDICINAL PLANTS FOR THE FUTURE
CONFERENCE**

**Sustainability
And
Ethical Issues**

**13-14th August 1999
Byron Bay
New South Wales, Australia**

Edited by
Andrew Pengelly and Anne Cowper

Published by the

National Herbalists Association of Australia Inc.
33 Reserve Rd Annandale NSW 2038
Ph. 02 9560 7077

© National Herbalists Association of Australia 2000

FOREWORD

The National Herbalists Association of Australia would like to thank the following people and organizations for their contributions towards this highly successful conference.

The Bunjalung Aborigines for welcoming us onto their traditional land

TRAFFIC Oceania and TRAFFIC North America.

The sponsors

The conference chairmen Nicholas Burgess (NHAA Vice-president) and David McLeod (NHAA President).

The behind-the-scene helpers: Anne and Jeff Cowper, Sunny Pengelly, Rob Santich, Robyn Kirby, Tere Alexeeff.

The speakers!

Speakers and facilitators for whom we were unable to provide transcripts: Robert Down, Howard Rubin, Adrian Miljke, Lionel Curry, Hans Wohlmut, Jonathan Vea.

Byron Bay Beach Club for providing such a great venue and service

Participants from around Australia and New Zealand

**Proceedings of the NHAA Medicinal Plants for the Future
Conference**

CONTENTS

Forward	1
Introduction	
<i>David McLeod</i>	2
Medicinal Plants: Prognosis for Conservation	
<i>Chris Robbins</i>	4
The Wildlife Protection Act and Medicinal Plants	
<i>Mick Trimmer</i>	10
Seed Saving Ethics	
<i>June Fanton</i>	16
Procuring Medicinal herbs for the Australian Market	
<i>Peter Purbrick</i>	24
Regulation of Herbal Medicines – how government regulation affects the supply of plant materials for medicinal use	
<i>Michelle McLaughlin</i>	33
Traditional Medicine, Environmental and resource management: an indigenous perspective	
<i>Carol Ridgeway-Bissett</i>	43
Preservation of Traditional Knowledge and Intellectual Property Rights	
<i>Robert McGowan</i>	48
Wildcrafting and Harvesting – Practice and Ethics	
<i>Andrew Pengelly</i>	60
Organic Certification, implications for industry and growers	
<i>Liz Clay</i>	70
Stakeholders in Herbal renaissance in Australia	
<i>Michael Schubert</i>	79
A comparison of American ginseng and goldenseal management strategies in the USA.	
<i>Chris Robbins</i>	86

Ethical Implications of appropriate of indigenous knowledge for commercial exploitation	
<i>Associate Professor Stephen Schnierer</i>	93
Purpose Growing of Phytopharmaceuticals	
<i>Tim Riordon</i>	97
Australian ginseng – the paddock or the bush?	
<i>Charlene Hosemans</i>	99
Native food, plants and medicines – research needs and opportunities	
Peter Hardwick	104
Conservation issues associated with use of native Australian herbs	
<i>Andrew Pengelly</i>	109
Conference outcomes and resolution	115

Introduction

David McLeod

Good Morning. I am David McLeod, President of the NHAA. My background is in Herbal Medicine and acupuncture, I am a practitioner in Brisbane and it is certainly great to be here amongst a more broad field of people involved in the herbal industry and profession. I would like to welcome you all growers, practitioners, traditional healers. It is lovely to see everybody coming together, great to see such a broad group and such a good response to the conference.

In the time that I have been involved in natural medicine, which is over twenty years there have been numerous changes. For all of the seminars which I have attended and been a part of, this is the first that the NHAA has hosted that has been on this theme. It is certainly showing that as an association and as a profession we are coming of age, and we have reached a level of maturity that means we can look at issues other than clinical ones. This is important, as to a large extent we are the end users of all of these things and it is important that we appreciate where they are coming from and the issue involved. It is quite significant this is the first conference without a clinical theme, it is great to be here and to be a part of it as an association.

We have a very long history being the oldest association in Australia for natural or any form of medicine. We were formed in 1920 and a lot of our work up until now has been in relation to clinical work and it is only in the last couple of years that we have significantly branched out. A big part of that has been with political work, that hopefully is gearing us up for this next struggle that is being addressed today about the issues of ethical harvesting, property rights and so on. Hopefully the NHAA is a group that can help within all of this.

Our resources lately have been used politically, issues such as the GST that have been on our agenda, lobbied heavily for and been successful in obtaining exemptions for our practitioners, unfortunately not for the products that are sold but only for our services.

As a Board we have been successful in having our Vice-President Nicholas Burgess, appointed to CMEC, Rob Santich appointed to the Expert Advisory Committee, and myself appointed to the Complementary Healthcare Consultative Forum. At the moment, the NHAA is quite well appointed and positioned for political fights within the country and there are still a lot of issues that have to come out. We are dealing on our level in terms of registration, regulation and issues that come out of this conference today. These issues may require some sort of political work and we are gaining some expertise in these areas.

So it is a real pleasure that we are now looking at this other issue, looking at the whole aspect of medicinal plants for the future, sustainability and the ethical implications of these - the theme of this conference. Environmental and conservation issues and the whole question of intellectual property rights, are areas that we should debate and be informed on. We know that for a significant period we have prescribed herbs, we see them in bottles and sending them out, but there is still not a lot of thought about where they are coming from.

Through groups like TRAFFIC Oceania, we will have the pleasure of Chris Robbins coming and talking to us shortly about issues such as Goldenseal and harvesting and looking at plants that are being wildcrafted to a point of near extinction. We have to start reviewing these herbs. We know that we use many of them and don't want to stop using them, but we may have to look at other means of obtaining them before they run out or before we endanger a species.

As participants here we should leave today with a much greater appreciation of the issues surrounding medicinal plants. This is a very positive move and it is a great thing for the association to be involved in.

Our Vice-President Andrew Pengelly has been with the Board of Directors for many years, has a very long and strong history in the herbal medicine profession in Australia not only as a practitioner but as a grower and as a harvester and manufacturer. The whole issue of this conference is his dream and he was the driving force in the Board to get this conference happening. It is therefore an enormous pleasure to see that it has been so successful and well attended. I thank you all for coming.

I would also like to thank the various sponsors of the conference, Traffic Oceania, of course who co-sponsored with us, and major companies Mediherb, Blackmores and Fauldings all put in a great deal of money to help make this happen. We also received sponsorship from Thursday Plantation, The Australian Herbal Connection Network, The Herbal Extract Company, Pharmafoods, Essential Therapeutics and Go-Vita. These conferences are not cheap to run, but with the help of these companies, we can achieve a lot more.

I'd like to now introduce our first speaker, Chris Robbins. Chris comes to us from the United States where he is the Program Officer of Traffic North America, the wildlife trade monitoring arm of the World Wildlife Fund. Chris initiated the debate which led to the listing of golden seal and is currently undertaking a review of North American medicinal plant availability in domestic and foreign markets focusing on the conservation and implications of wild harvesting. In 1988 Chris published the text "American Ginseng" which looks at the North American medicinal herb trade and he received his undergraduate degree in Natural Resource Management from the University of New Hampshire. So please welcome Chris.

MEDICINAL PLANTS: PROGNOSIS FOR CONSERVATION

Chris Robbins, Traffic North America

I decided my talk this morning should be a progress, or positive, report, and not a "gloom and doom" forecast for the future of medicinal herbs and their long-term conservation. I'm well aware of the fact that I'm speaking to largely an industry audience. And my intention during the next 30 minutes is not to warn, overwhelm or berate the herb industry about its impact on the resource. The very title and nature of this conference "Medicinal Plants For the Future: Sustainability and Ethical Issues" suggests many of you are here because you are truly interested in or concerned about the sustainability and conservation of this important resource. So, this is an opportunity for me to present and leave you with a summary of what steps have and are currently being taken to better understand the scope, scale and ecological significance of the medicinal plant trade. And, more importantly, I'd like to leave you with a sense of encouragement and empowerment; that is what specific action(s) can individual wildcrafters, companies and consumers take to conserve plants used as or in medicines.

I ask that you forgive my heavily slanted U.S. point of view and the profusion of references to the U.S. herb trade and industry. I believe there are probably more similarities than differences between Australia and the United States in consumption of and attitudes towards herbs. So many of the issues, concerns and solutions to conservation problems that apply to the United States may have similar application to Australia and other developed countries.

I've often mused to myself if and when the recent renaissance in herbal medicine will reach its zenith and, as a consequence, would then take pressure off wild populations and species of medicinal plants used by industry. However, I don't believe there is a foreseeable peak in use of herbs so we shouldn't wait for the reprieve some of us in the conservation community are anticipating.

What began really with the experimentation of therapeutic plants for recreational use in industrialized countries in the 1960s has evolved into a multi-million dollar mainstream market in the 1990s. Herbs such as ginseng, Echinacea, St. John's wort and ginkgo, just to name a few, have become household names in the United States and are now advertised nationally on television. Herb use is being woven into our cultural, social and economic fabric. The popularization and commercialization of herbs in developed countries, particularly the U.S., is in response to an increasingly expensive and unpredictable health care system combined with effective marketing and promoting of herbs to consumers. In many ways, self-medicating with herbs and herbal products is perceived as a more convenient, cost-effective and natural approach to treatment than conventional medicine.

As a testament to the herb industry's efforts to gain greater legitimacy for its products, the United States Congress passed a law in 1994 that reclassified herbs as dietary supplements. This law has made it easier for herbal companies to manufacture and sell herbal products by reducing the regulatory hurdles for dietary supplements. With less red tape and government regulation, the botanicals business in the United States has bloomed and shows no sign of wilting any time soon.

Another sign of herbal prominence is the emergence of pharmaceutical interest in herbs and the herb marketplace. Recognizing the enormous potential for profit, major pharmaceutical companies are investing in the botanicals business, producing their own line of herbal products. Herbal products manufactured by drug companies may actually help promote their credibility and legitimacy among users because the pharmaceutical industry is held to a higher standard of safety, quality and efficacy.

Herbal medicine is not the only industry experiencing an enormous increase in demand for medicinal plants. An increasing number of companies that manufacture foods, beverages, cosmetics and industrial products such as dyes, insecticides and fungicides are relying on plants or their active constituents. These companies extol the natural benefits and environmental virtues of plant-based products and are counting on the purchasing power of health-minded consumers to increase the popularity and profitability of these products.

As ethnic groups have increased their travel and relocation overseas, they bring with them their customs, including ethnobotanical knowledge and practices, which then become a part of the herbal landscape. We see this phenomenon in the United States where companies manufacturing and marketing traditional Chinese remedies and Ayurvedic medicines are not only catering to ethnic Chinese and Indians but are also pitching their products to American consumers.

Just to give you an idea of growth in herbal medicine interest over the past five years, I've graphed the number of popular press articles that were published from 1994-1998. There has been a steady rise in articles about or referencing medicinal herbs and herbal remedies. The mainstream media is reporting on the issue with increasing intensity and interest. This graph, which includes most major newspapers worldwide printed in English, is a general reflection of the rate at which the public's interest in herbs has increased.

According to an article in the prestigious Journal of the American Medical Association, the percentage of the U.S. population that uses herbal medicine increased from 2.5% in 1990 to more than 12% in 1997. This means that there were approximately more than 20 million more people in the United States using herbal medicine in 1997 than 1990.

To help us appreciate the size of the medicinal plant trade on a global scale, I've graphed the most active trading countries. The world's top producers of medicinal plants and consumers are fairly well distributed. However, 3 out of the top 5 exporters and importers are located in Asia, which reflects this region's large role in the medicinal plant trade. Clearly, as the world's largest medicinal plant suppliers, China and India are examples of countries that have an enormous vested economic and social interest in medicinal plants. We've heard of world-famous Chinese and Indian herbs such as *Panax ginseng*, *Eucommia*, *Neem* and *Rauvolfia serpentina*. Both countries are taking steps to reduce their dependency on wild sources of medicinal plants and protect a commodity by promoting conservation through cultivation and regulation.

The importance and prominence of plants in traditional medicines, particularly in developing countries, is widely documented, yet much is still unknown or misunderstood about the biological and conservation needs of species utilized. Whether it is traditional Chinese medicine in China, Ayurvedic medicine in India, or Indonesian or African traditional medicine, plants are a staple medicine for which there may be no pharmaceutical or over-the-counter drug substitute. Furthermore, the cost of these imported manufactured medicines is often prohibitive, forcing many communities to rely on locally available, abundant and more affordable plants for medicine. As developing countries have established independence from colonial rule, many of their traditional practices, including use of traditional medicines that were once suppressed or regulated by colonial administrations, are now re-emerging and being re-legitimized and promoted.

This is the case in Africa where in some countries healers and users of herbs during colonial times were regarded as witchdoctors and their practices and medicines were outlawed. As colonial influences ebb and indigenous cultures and customs resurface, there is a corresponding rise in interest in and demand for medicinal plants.

For the past several years, conservationists have wondered about the biological and ecological implications of escalating consumption of medicinal plants. Not only have biologists' doubts been raised, but health experts have also become increasingly concerned about the growing competition for medicinal plants between traditional users and commercial traders. And what effects heavy extraction of raw material for commercial trade might have on the well-being of rural communities dependent on plants for medicine. Even The World Bank has recently weighed in on the issue. In a 1997 report entitled "Medicinal Plants: Rescuing a Global Heritage," The Bank had this to say about medicinal plants "While other cash crops have received millions of dollars of research support, the production of these exceptionally promising generators of income and well-being are left to languish and are therefore decreasing and many are in danger of disappearing. Yet local consumers, industries, and exporters are clamoring for more herbal ingredients and such demand is likely to continue to soar while supplies of raw materials from wild sources of medicinal plants are rapidly shrinking."

This statement conveys two powerful, albeit mixed messages: medicinal plants represent a source of financial security to rural stakeholders such as harvesters, growers and processors, yet the sobering reality is that demand exceeds nature's supply of this resource.

Concerns about the sustainability of the medicinal plant trade have focused on the voluminous commercial trade in raw material used in herbal products and phytomedicines. Very little was known about this trade to the conservation community, which is why conservationists have made it a priority to research medicinal plant trade and its implications for the conservation of affected species.

I'd like to mention a few concrete examples of initiatives that have made or are making a contribution to improving the transparency and sustainability of the medicinal plant trade.

In the late 1980s and early 1990s, various strategies and studies were being developed to address the biological realities, complexities and needs of medicinal plants exploited for commercial trade. The first notable development was the "Chiang Mai" Conference of 1993. It was this year that the World Health Organization (WHO), World Conservation Union (IUCN) and World Wide Fund for Nature (WWF) sponsored and convened an international meeting in Chiang Mai, Thailand for conservationists, scientists and health care administrators to discuss for the first time a strategy for conserving medicinal plants. The meeting's participants released a statement known as the Chiang Mai Declaration. This Declaration advocated greater involvement of the United Nations, its Agencies and Member States, other international agencies and their members and NGOs in addressing the threats to medicinal plants and taking the necessary corrective action to reduce and eliminate threats. A series of guidelines were also prepared that "provide a framework for the conservation and sustainable use of plants used in medicine." The guidelines recommend basic studies to research commercially and ethnobotanically important species, their distributions, utilization and *in-situ* and *ex-situ* conservation.

The Chiang Mai Declaration and guidelines raised to a higher political and social level the importance of cataloging and conserving medicinal plants for future generations.

Following these guidelines came the establishment of the SSC/IUCN Medicinal Plant Specialist Group. This group, founded in 1994, is one of 102 specialist groups within IUCN's Species Survival Commission, whose primary purpose is to develop an action plan for the conservation of medicinal plants, focusing on priority species at the taxonomic and geographical level. I can't begin to explain the positive impact this group is having on the coordination and communication of information on medicinal plant conservation. It has been enormously proactive and productive. With 70 members worldwide, who have expertise and interest in medicinal plant conservation, this group has been a successful vehicle for the exchange of information among members and to the general public, by producing a medicinal plant conservation newsletter, directory and annotated bibliography, publicizing and participating in relevant

international fora and encouraging dialogue. The SSC/IUCN Medicinal Plant Specialist Group continues to be an influential and effective voice in the medicinal plant conservation community. I encourage all of you to subscribe to the Medicinal Plant Specialist newsletter and support the work of this organization.

A close collaborator with the SSC/IUCN Medicinal Plant Specialist Group is TRAFFIC, the joint wildlife trade monitoring program of World Wildlife Fund (WWF) and IUCN, the World Conservation Union. TRAFFIC strives to ensure that the trade in wild animals and plants is sustainable and legal. This mandate calls for considerable research and understanding of trade and its potential implications for the conservation of species involved. Medicinals and, in particular, medicinal plants represents one of TRAFFIC's most active areas of on-going research and reporting. Much of TRAFFIC's work on medicinal plants has involved gathering, evaluating and disseminating information on the trade in plants used in traditional and herbal medicines. Where trade in specific species is or could become unsustainable, TRAFFIC recommends corrective or preventative measures such as national or international trade controls.

This was the case with goldenseal, where trade was a growing threat to wild populations. TRAFFIC believed immediate and swift action was needed to protect goldenseal from heavy wild collection for domestic and international trade. CITES was the only regulatory instrument available to control trade in goldenseal, most of which was sourced from the wild. I want to stress that while CITES action for goldenseal was necessary, it is not a long-term solution that will ensure the sustainability or future supply of wild goldenseal.

What is significant about the CITES listing is its catalyzing effect on conservation efforts in the United States. Industry, government, conservationists and other stakeholders. They are all working together to implement a participatory monitoring program that would meet the requirements of the CITES listing for goldenseal, yet hopefully serve as a promising domestic model for monitoring and controlling trade internally before having to resort to CITES for protection. I'll discuss and compare the nuts and bolts of the goldenseal and ginseng monitoring programs in my presentation tomorrow.

So TRAFFIC explores and identifies other means by which the conservation of priority species can be achieved and how emerging trade issues can be detected and defused before devolving into serious conservation problems. Educating the public, including industry and consumers, about the implications of and solutions to their consumptive behavior can be initially challenging but ultimately rewarding. Sensitivity to the cultural and economic forces associated with the use of species in medicines is a key consideration and recognizing this concept should lead to a course of action that is acceptable to both consumers and conservationists.

Addressing the current status of medicinal plant conservation issues and activities would not be complete without mentioning the critical and commendable role of the industry in this area. A significant boost to medicinal plants and their conservation, particularly in the United States, is due in part to efforts by and within industry. We don't often speak of conservation of a natural resource and industry's use of that resource in the same breath, at least not positively. However, the herb industry is remarkably different. Many herbalists and herb companies in the United States, for instance, are embracing and engaging the issue with refreshing enthusiasm. Conservationists as well as practicing herbalists are publishing editorials and articles on medicinal herb sustainability and conservation in popular and widely-read industry journals such as *Herbalgram*.

Even trade associations are concerned about supply issues support efforts to ensure that their industry is sustainable and ethical. For instance, the American Herbal Products Association (AHPA) helped design and set up the monitoring program for goldenseal in the United States. The same association commissioned a recent survey to estimate current and future levels of goldenseal production from

cultivated sources. This study not only improves the transparency of goldenseal trade for resource managers, but also promotes goldenseal as a viable and valuable agricultural crop to farmers.

Charitable organizations created by and for herbalists at the grassroots level are developing and promoting guidelines for the ethical and sustainable harvesting of wild plants. One such NGO, United Plant Savers, which advocates the restoration and conservation of habitat for native North American medicinal plants in the United States, has a diverse membership comprised of herb growers, vendors, retailers and users. UpS has prepared a list of "at risk" native herbs that need conservation attention and action. This group is also identifying and promoting the establishment of botanical sanctuaries, which are managed for the planting and sustainable production of medicinal herbs at risk from overexploitation. This sort of grassroots activism and responsible land stewardship is also reflected in the efforts and activities of U.S. herb companies.

Once such company is Frontier Natural Products. Frontier is a large U.S. importer, distributor and organic grower of botanicals whose commitment to the conservation of native North American herbs is paving the way for other U.S. companies to undertake or support similar conservation measures. In 1997, Frontier purchased 68 acres of woodland in southeast Ohio (a botanically rich area that is nestled in the Appalachian/Blue Ridge Forest ecoregion) and soon thereafter established the National Center for the Preservation of Medicinal Herbs, which is dedicated to the research, organic farming and protection of native herbs on this site. This company, in cooperation with local and national advocacy groups like UpS, is providing other companies and industry as a whole with the inspiration, encouragement and knowledge to contribute to the conservation of medicinal herbs and their habitat by setting an important precedent.

I've summarized some recent and on-going activities and accomplishments in medicinal plant conservation. I'd like to present and leave you with a few ideas that industry and individual companies and collectors might consider to promote the sustainable utilization of medicinal herbs.

- Support "forest farming" of species for which commercially cultivated raw material does not exist. Between two-thirds and three-fourths of medicinal herbs sold in the U.S. are still sourced mainly from wild populations. It's my belief that we can augment the availability of raw material on the market and enhance the value of habitat by promoting "woodsgrown" cultivation. We see this with ginseng in the United States where healthy plants managed in an ecologically sensitive manner in forests produce roots that resemble wild roots, which are more valuable than roots from field or artificial shade grown ginseng. Farmers are less likely to convert their forests to pastures or sell their woodlands to developers if their wild lands are productive and profitable in other ways. An obvious word of caution: avoid introducing and growing non-native plants that may pose a threat to native flora and ecosystems.
- Be aware of signs of increasing demand for and/or diminishing supplies of species obtained from wild sources. If demand exceeds supply for such a species, be proactive and use other parts of the plant that are renewable and that meet your medicinal efficacy and safety standards. As goldenseal has become increasingly rare and its root quite expensive, U.S. herbal vendors are selling goldenseal leaf and stem as a more affordable and abundant substitute.
- Understand the biological and ecological constraints (weaknesses) of species before collecting plants from the wild. For instance, avoid harvesting plants early in a growing season so as to allow plants to fruit and produce viable seed for replanting. You should avoid collecting all of something and the last of anything. Leave a healthy number of plants in a patch or stand for regeneration and harvest parts of plants that are renewable and won't result in the destruction of a plant (leaves or fruit versus roots or rhizomes).

While the conservation of medicinal plants is more of a priority today with corporate, governmental, environmental and consumer stakeholders compared to just a few years ago, challenges and work lay

ahead of us. Trade's impacts aside, there are other forces that pose a threat to the availability and quality of medicinal plants from which so many of us benefit therapeutically and economically. Some of these threats include loss of prime habitat and the introduction, invasion and proliferation of exotic species outcompeting and choking native medicinal flora. A good example of an invasive medicinal plant is kudzu, which can grow up to 18 inches each day. Kudzu blankets more than 4,600 acres of land and native vegetation each day in the United States. Despite its unfortunate introduction to the U.S., we have found innovative ways to harness the plant's economic and practical value, making and selling a variety of products including herbal preparations, soap, baskets, candles and syrup. Paradoxically, heavy harvest of a plant, in this case, kudzu, in the United States is beneficial to the natural environment and, as a means of managing the spread of the plant, should be encouraged.

In interacting with long-standing ginseng dealers (who are incredibly observant of and intimately familiar with their environment), I've heard them say that they have seen substantially lower rainfall in the past 20 to 30 years that they believe is harming or hampering ginseng. Anecdotal or not, this insight suggests that changes in climate may be altering the abundance and distribution of species that are important in traditional and commercial herbal remedies.

So not only should we continue to monitor and, if necessary, control trade, but we should recognize and address the other threats with which medicinal plants are faced.

As long as commercial interests are balanced with ecological realities and conservation measures, we will contribute to the sustainability of medicinal plants, and to the security of users, well into the next millennium.

The Wildlife Protection Act and Medicinal Plants

Mick Trimmer
Director
Wildlife Protection
Environment Australia
GPO Box 787
CANBERRA ACT 2601

ABSTRACT

This paper will discuss:

- Australia's obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- the administrative requirements of the *Wildlife Protection (Regulation of Exports and Imports) Act 1982*.
- why traditional medicines containing ingredients derived from protected (endangered and threatened) species are regulated by the Wildlife Protection Act.
- the recent amendment to the Wildlife Protection Act in relation to advertised claims and the implications for importers of traditional medicines.
- controls on the export of Australian native wildlife for use in traditional medicines.

The Federal Government has responsibility for the control of the import and export of wildlife and wildlife products. The *Wildlife Protection (Regulation of Exports and Imports) Act 1982*, which is administered by Environment Australia, controls the export of Australian wildlife and wildlife products, the import of most live animals and plants, the import and export of all wildlife which is recognised internationally as endangered or threatened. The Act also provides the legislative basis for meeting Australia's responsibilities under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

The Wildlife Protection Act is one of a number of laws, including health, quarantine and customs which applies to the import of traditional or alternative medicines.

CITES and the Wildlife Protection Act

The over-exploitation for trade of many wildlife species led to CITES being drawn up in 1973. Australia is one of 145 countries that are signatory to CITES, being a party since 1976. The objective of CITES is to prevent international trade threatening species with extinction.

Each participating country is required to implement CITES by controlling the trade in species listed in the Appendices to the Convention. Each Appendix affords the listed species a certain level of protection, for example, Appendix 1, is the strictest level; Appendix 2 is less so. The closer to extinction a species is, the higher the level of

protection afforded, for example, as tigers are close to extinction, their trade is strictly controlled.

CITES member countries meet about every two years to consider relevant issues and to amend the Appendices as necessary. These meetings are known as the Conference of the Parties. Any member country(s) can nominate a species for listing; nominated species not having to be native to the nominating country(s). The Conference decides which Appendix to place a species and may refer a matter to one of its committees (Animals and Plants) for advice.

In Australia, CITES controls are put into effect through the *Wildlife Protection (Regulation of Exports and Imports) Act 1982*. The Act is administered by Environment Australia and is enforced at Australia's border by the Australian Customs Service.

The Wildlife Protection Act controls both the export and import of CITES listed species (CITES Appendices are included in the Schedules to the Act) and the export of native Australian species.

Control of trade in wildlife subject to the Act are typically in the form of permits to export or import wildlife and wildlife products. Permits must be obtained from the country of export AND the country of import BEFORE entering Australia. Without the appropriate permits, the product/s will be confiscated by Customs and it may not be possible to have them returned.

Controls apply to anyone wishing to import or export wildlife listed in the Schedules, including:

- museums, zoos, scientific institutions, commercial organisations, tourists, the general public; and
- anyone importing traditional or alternative medicines containing or representing to contain an endangered species.

Other government controls may also apply to the import and export of traditional medicine including:

- quarantine – Australian Quarantine and Inspection Service
- health – Therapeutic Goods Administration
- State controls

The Wildlife Protection Act and Traditional/Alternative Medicines

From 1996 to 1998, over 3 000 traditional medicine items were seized by Customs on entering Australia. Of these, over 500 claimed to contain CITES listed animal species, including some of the most highly endangered - tigers, bears, rhinoceros, leopard, cobra, turtle/tortoise. Many included endangered plant species including ginseng, cactus, orchid and cycad.

The continued and uncontrolled use of endangered species in products such as traditional medicine has been the subject of particular concern among the signatory nations to CITES including those countries that have practised in traditional or alternative medicine for thousands of years, such as China and Japan.

CITES member countries have acted on this concern in recent years by agreeing unanimously to a number of resolutions urging countries to strengthen controls on products containing endangered species. At the most recent conference of CITES held in 1997, it was agreed that member countries should ensure that their national legislation effectively controls trade in:

- any products claiming to contain tiger specimens
- all parts and derivatives of species used for healing purposes and trade in medicinal products containing or claiming to contain them

Countries also agreed that:

- the term 'readily recognisable part of derivative' used in the Convention be interpreted to mean to include any specimen which appears from an accompanying document, the packaging or a mark or label to be a part or derivative of an animal or plant; and
- Governments should work with traditional medicine communities and industries in developing education and awareness towards the reduction and eventual elimination of illegal use of endangered species.

Why is the amendment to the Wildlife Protection Act necessary?

The Wildlife Protection Act prohibits the export and import and, in some cases, the possession of products containing an endangered species, unless they are accompanied by an export AND import permit.

However, in its current form, the legislation does not enable the Government to successfully identify the illegal import into Australia of many products that contain endangered species because forensic science is not currently able to provide the required level of certainty. Thus, despite the prohibition, imported traditional medicines containing endangered species remain available.

The proposed amendment will ensure that all products represented to contain an endangered species, such as tiger and rhino, are treated as if they do, in fact, contain the ingredient. The only proof required for prosecution will be the claim on the label. It is not the intention of the amendment to prohibit the general use of images of wildlife as a marketing tool. For example, where a product obviously does not contain material from endangered species such as:

- Esso's tiger in your tank, or
- the tiger as a mascot for a sporting team (football, basketball etc).

The amendment has been passed by the Parliament and came into force on 6 May. The amendment is supported within Australia by a wide range of environmental and conservation groups and leaders of the traditional medicine community.

Other countries, including European Union nations, United Kingdom and USA, have already introduced similar measures.

In line with the above CITES resolutions, the Minister is committed to the Government working closely with the traditional medicine community to successfully implement this amendment to highlight the plight of endangered species and to promote the use of alternative substances in traditional medicines.

Now that the amendment has come into force, Environment Australia will shortly produce and distribute a booklet outlining the new requirements and how to meet them. Some background information on the amendment and current import requirements is available in the information pack provided today.

Controls on the export of Australian native species

Artificially Propagated Plants

Nurseries/growers who are artificially propagating plants for export must have their operation approved by Environment Australia. The operation must meet the following requirements:

- the plant must be grown by humans from seeds, cuttings, callus tissue, spores or other propagules under controlled conditions (see below)
 - the seeds, cuttings, callus tissue, spores or other propagules from which the plant is grown are:
 - established and maintained in a manner not detrimental to the survival in the wild of the kind of plant to which that plant belongs; and
 - managed in a manner designed to maintain the breeding stock indefinitely

Please note 'controlled conditions' means the growing of a live plant in an environment that:

- is intensively manipulated by humans for the purpose of producing the kind of plant to which that plant belongs; and
- includes characteristics such as weed control, irrigation, tillage, fertilisation and nursery operations such as potting, bedding and protection from the weather.

Applications for approval as an artificial propagator should include (for each species):

- details and photographs of the propagation operation
- an explanation of the methods and procedures used to propagate the plants, such as whether the plants have been germinated from seed, propagated from cuttings
- details of the facilities, (ie greenhouses, plant beds etc) used
- copies of all relevant State licences or other documentation that support the application

Please note that an inspection of the operation may need to be carried out.

Export Harvest operations

Another way that plants may be exported is by having the operation approved under the controlled specimen provisions of the Act. This provision is usually used in circumstances where plants/plant parts are being harvested from the wild. This includes:

- ◆ small scale harvest operations
- ◆ trial harvest situations
- ◆ salvage harvests in certain situations
- ◆ importation of CITES listed species from overseas
- ◆ large state wide harvesting programs managed by State government departments

Under this arrangement, the applicant is required to provide:

- ◆ details of the area of the collection site
- ◆ the quantity being collected
- ◆ impact of the harvest on the environment
- ◆ methods used to monitor the collection
- ◆ method of collecting
- ◆ information on the biology of the species being collected

Please note that approval to collect wild native plant species to export commercially can only be granted for plants covered by State/Territory legislation. This applies to native plants that are collected from Crown, leased and private land.

Exemptions

Certain Australian native plant specimens may be exported without a permit or an authority. These are listed on Schedule 4 to the Act and include:

- ◆ all seeds (excluding foxtail palm *Wodyetia bifurcata* seeds), spores, pollen, tissue culture or flaked seedling culture
- ◆ fruit (whether or not containing seeds or spores) not attached to any part of a plant
- ◆ timber, bark and wood chips
- ◆ an article derived from timber

- ♦ oil distilled or otherwise extracted from *Eucalyptus* species, *Melaleuca alternifolia* and *Melaleuca linariifolia*
- ♦ Honey
- ♦ **artificially propagated plants** which are the **personal property** of a person **departing** Australia and which are not intended to be used for any commercial purposes, including sale, lease, hire or exchange
- ♦ plants taken under a State run management harvesting program approved under the Act (ie QLD, WA) and which are the **personal property** of a person **departing** Australia and which are not intended to be used for any commercial purposes, including sale, lease, hire or exchange

Please note that changes to the exempt list are likely in the near future. For example, seeds and fruits of most species will soon become subject to the Act and many cultivars and hybrids of native plants are likely to become exempt.

Conclusion

The Government is committed to wildlife conservation internationally, as well as within Australia. The best way to achieve this laudable goal is for everyone - the wildlife industries, community and government to work together.

Essentially, we are all seeking a win/win outcome - for the traditional and alternative medicine industry and the wildlife industries to grow and prosper, and to protect and conserve endangered wildlife and give it a chance to prosper too.

NATIONAL HERBALISTS CONFERENCE - MEDICINAL PLANTS FOR THE FUTURE

Jude Fanton, Seed Savers' Network

ABSTRACT

With the ever-increasing advance of genetically modified crops, communities must take responsibility for the genetic integrity of their medicinal, their food plants and other useful crops through collection and conservation. The Seed Savers' Network has been doing this for 13 years.

ETHICS OF SEED SAVING/COLLECTING

What are medicinal plants? Are carrots which are good for stomach function, or watermelons - for kidneys?

Diet is what you have in large doses 100% of the time whereas medicine you have hopefully as an occasional and small dose that is specific to one part or function of the body. "Let your food be your medicine and your medicine be your food," said Hippocrates. Traditional healers at the Pacific Arts Festival three years ago in Western Samoa tackled this concept in their workshops.

SEED PRODUCTION AND BREEDING

Ethics that are easy to hold

- * Recognising the legacy of past custodians/breeders
- * Taking responsibility for maintaining varietal lines
- * Diversity in plant populations maintained and renewed
- * Highest quality in terms of medicinal value
- * Not chemically dependent
- * Not Hybrid
- * Not GE

* Recognising the legacy of past custodians/breeders

There is a "chain of command" sent down the line from the dim days when we first cultivated any one plant. Each gardener or farmer that has selected seed has sent on a whisper of what he or she wanted from a plant - it may be a Chinese whisper, the distortions may be increasing, but there is still a connection with past breeders or custodians in any cultivated plant.

- * Taking responsibility for maintaining varietal lines

The ideal, most ethical, path for a grower would be to obtain seed from as local a source as possible, to prioritise the bulking up of those seeds,

and then to maintain them forever. Feeling responsibility for the wellbeing, if that does not sound too banal or too emotional, of a variety that you take on in your garden, or on your farm, is not a common emotion. It is too easy to go and buy another tin or packet of seeds. Yet when you grow a crop, it is part of the full cycle of growing that you, if you will pardon the pun, see through the pregnancy, that you aid in the birth of the seeds, and go on to care for the progeny.

* Diversity in plant populations maintained and renewed

Diversity in the population would be maintained by selections being not totally rigorous. Renewal of diversity might be from time to time achieved with seed swapping with other growers in the region, perhaps from a different altitude.

Seed gifts, seeds sold at markets, seeds swapped at festivals and fairs: even in the most stable societies, there have always been cultural channels along which seeds have moved. Diversity is thus maintained.

* Highest quality in terms of medicinal value, local adaptation

Along the way there would be opportunity for selection and that would always be for highest quality in terms of medicinal value, adaptation to local soils and conditions, and other characteristics convenient to the grower him or her-self. There would not be any compromise such as the sacrifice of quality for increase in production, for that would infer depletion of the soil.

As with wild plants, cultivated plants need to be collected from a local provenance for local adaptation.

* Not chemically dependent

Agrotoxin chemicals would be shunned for it is not environmentally ethical to use them. I would like to explore this when I consider GE crops further along in my talk.

Maybe this is too rosy a picture for modern herb farmers who must achieve economies of scale, go the monoculture way and buy in seed because there is neither space nor time to produce their own. However we must only extrapolate forward a few decades to realise that we cannot sustain the continual reliance on being able to obtain anything we want from virtually any part of the globe. Things will tighten up. Plant patenting on the one hand and restrictions on plant piracy on the other will make it difficult for planting material collectors to go as far afield as they have been. If any figment of independence is to be maintained, there should be more

farm-saved seed.

These are conventional ethical considerations. Before I deal with the more controversial ones I would like to explain a little of what we do at The Seed Savers' Network.

THE SEED SAVERS' NETWORK

The Seed Savers' Network, comprising of gardeners and farmers, conserves varieties of useful crops that are suited to small scale farming and home gardening. Traditional crops varieties have a long record of growing well without pesticides and have proven safe to eat for centuries.

Seed Savers was started in 1986 in response both to corporate takeovers of family seed companies with the resultant flooding of the market with increasing numbers of hybrids and to plant patenting legislation. We began collecting Australia's best garden and farm open-pollinated varieties through a novel seed exchange system. This involves both a central seed bank that receives seeds from the gardening public and the publication of what seed savers across Australia offer one another. We have termed this a network because over these thirteen years a strong body of knowledge and a stock of strong home and farm-saved seed have been maintained.

Responding to our appeals in numerous articles and radio and television interviews, gardeners and farmers have sent seeds they have had in their family for generations. Some examples are watermelon, corn and bean varieties arriving in Australia in the mid 1800s whose seeds have been saved ever since. More than 70 varieties of herbs were offered in our last year's exchange.

By saving seeds every year and choosing the strongest and healthiest plants these varieties have become locally adapted to local soil and climate conditions and resistant to prevalent pests and diseases.

OVERSEAS

Over recent years, The Seed Aid Trust part of the network has fostered similar networks in the Solomon Islands, Tonga, Cuba, Cambodia and in south-eastern Africa. Seed production training is provided to organisations concerned with producing food at the village level.

* Not Hybrid

For what is a hybrid but a high response variety? and a non-event the next growing season?

* Not GE

We have been promised an agri-technological utopia where man is creating life through Genetic Engineering (GE) processes.

HAZARDS OF GE

Fib 1: It is safe for consumption - GE, euphemised as only a genetic modification, is a test tube science recently applied to food production and prematurely released onto unsuspecting consumers.

We must remain skeptical about ingesting GE food until more thorough evidence shows that it is safe for consumption. The study of a gene in a test tube can tell only what that gene does in that particular situation but does not predict what it might do if released into the environment and onto people.

With hundreds of GE varieties of food plants in preparation, it is our duty to look after what have been passed on to us by our elders.

Fib 2: That GE crops are not all that different from conventional crops. A fish with a tomato, a pig with a cabbage, *Bacillus thuringiensis*, a soil microorganism with potatoes and cotton; are you kidding? The speed at which these changes can now be made is frightening. As the computer industry grew exponentially, so the gene industry is. Monsanto's company report last year put it this way: "At Monsanto we believe that these genomic technologies will continue to double in capability every 12 to 24 months - a statement we're calling "Monsanto's Law".

Fib 3: That they are benign. That they are just twiddled, modified is the word, a little bit. I prefer to style it as "engineered" as this is the more accurate description of splitting a gene. If they are so proud of their products, the manufacturers should put a logo on the front of the item with "GE FOOD" brightly announced.

Fib 4: That they are not very different to conventional crops. This is expressed further down the food production line that the products are "substantially equivalent" and therefore need not be labelled.

Fib 5: That they are safe for the environment. Roundup Ready foods, notably soya beans, canola, corn and cotton represent an enormous proportion of GE crops, only increase the use of Roundup. This chemical is the third most commonly reported cause of pesticide related illness among agricultural workers - laboratory studies have found adverse effects in all standard categories of toxicological testing. these include medium-term toxicity (salivary gland lesions), long-term toxicity (inflamed stomach linings),

genetic damage (in human blood cells), effects on reproduction, in particular sperm quality and count, and carcinogenicity in rats.

Glyphosate has been described as "extremely persistent" by the US Env Protection Agency, and half lives of over 100 days have been measured in field tests in Iowa and New York. Surfactants that are necessary for the proper spreading of the chemical are more toxic, and the cocktail of both chemicals is yet more toxic.

By destroying vegetation upon which beneficial insects, birds and animals are dependent, populations are reduced.

Crops may also become weeds in the form of "volunteer plants" germinated from seeds after the harvest, so that other chemicals will have to be used.

Bt has been used by organic producers for some time as a pesticide. By inserting the Bt gene into large scale industrial crops, there is now a threat of creating insect populations that are resistant. This is recognised by Novartis insisting in its farmers' contracts two years ago that 5% of the crop area be planted to a non-Bt variety to provide a refuge for non-Bt resistant pests to breed in. That percentage is now up to 20%!

This whole question turns on the scale on which a crop is grown. I know I am speaking to people who probably don't grow on such massive scales. But we can extrapolate from these excessive examples, and certainly the herbalists amongst you will be seeing patients that are affected by these large scale changes.

Fib 6: That GE is a solution to world hunger. Although GE technology is being presented as a solution to world hunger through increased yields, the bulk of GE crops, e.g., corn, canola, cotton and soya, are produced mostly for animal fodder and industrial uses, such as small but ubiquitous ingredients like thickeners, emulsifiers, sweeteners and flavour enhancers in the majority of processed food products.

The corporate giants involved in GE demand from farmers substantial royalties for their seeds and insist on, and systematically enforce, contracts stipulating no portion of the seeds are for regrowing. Rather than benefitting from GE products, our farmers and, even worse, those in developing countries will be further indebted.

In any case it is the third world that routinely provides food and many medicinal plant genes and produce for the first world at cripplingly low prices.

Genetic engineering should be given the big miss as it is unproven and it

is being pushed along by such organisations as gave the world PCBs and Agent Orange.

BIO PROSPECTING

- * Recognition of IPR of indigenous peoples' custodianship and/or breeding - the "ethnics" of seed saving
- * Documentation of current and past uses
- * Recompense for IPR

* Recognition of IPR of indigenous peoples' custodianship and/or breeding - the "ethnics" of seed saving

A year ago Michel and I taught on a two week course in Applied Ethnobotany in Sabah run by the UNESCO / WWF / Kew Gardens collaborative programme, People and Plants. Glenn Wightman from the NT was also there and gave many insights into how he has changed his procedures on documentation and recognition of intellectual property rights that aboriginal communities have over plants. It is just not good enough to go in and assume that you have the right to their knowledge. Much of the documentation that Glenn is now involved in is because the elders want to record their knowledge for the younger generations. Print runs are very small; they are not so glossy, but the font of knowledge is controlled by its source.

- * Documentation of current and past uses

EXAMPLES:

1. Community Ethnobotanical Manual in Choiseul, Solomon Islands, undertaken by the Kastom Garden Project in collaboration with the Botanic Gardens in Honiara and APACE in Sydney. This is documenting local wild foods on the island of Choiseul which the locals wanted. They did not want to document their medicinal plants as they considered that too sensitive information.
2. Manual of Forty Five Medicinal Plants of the Dusun Kadazan compiled by People and Plants. Once again the usage of the manual is controlled by the community which arrives at a decision after a long consensual process, which is their usual method anyway. In this case they also decided that its main purpose was for educating their children.

- * Recompense for IPR

This is an extremely tricky area for any ethicist, let alone a mere herb grower, or home seed saver such as myself, but we all need to keep a strong sense of right and wrong when dealing with IPR. Dr Worede has made sure that germplasm that might leave his country, Ethiopia, will be firstly accounted for, and secondly paid for. All plant explorers must be

accompanied by an Ethiopian botanist and stringent procedures are laid down.

Ethiopia is the centre of diversity, meaning the place where domestication occurred, of such important plants as coffee, cotton, several cereals and melons. It has a wide range of climates and topographies and is a rich prospecting ground for ethnobotanists.

WILD HARVESTING

- * Stringent regulations
- * Indigenous involvement

* Stringent regulations

There was quite a flurry of seed collecting activity in forests in this area when the Carr Govt recently changed their status.

* Indigenous involvement

EXAMPLE: Mt Kinabalu Park, Sabah, Malaysia, the local Dusun Kadazan people are replanting their forest with fruit trees and medicinal plants, paying particular attention to varietal differences. Parts of the periphery of the park have been reinstated to them for use as wild harvest areas. They are replanting with germplasm from nearby areas, both inside and outside the park.

WHAT YOU CAN DO

1. Save your own seeds
2. Breed your own seeds by selection
3. Swap seeds with other growers through an exchange such as Seed Savers (over 70 varieties of herbs swapped last exchange).
4. Form seed and planting material swapping groups whether within existing growers' groups such as SGAP or forming new groups such as The Native Seed Savers' Network in the Sydney and central western NSW area.
5. Raise public awareness of the genetic makeup of food and medicine plants.

and lastly, the hardest road of all:

6. Lobby for greater freedom for individuals to swap planting material and greater control on the efforts of large consortia to control our food and

pharmaceutical systems.

The efforts of all the people who send their seeds to Seed Savers, renew stocks, contribute their various skills and subscribe to the network are greatly appreciated.

Michel and Jude Fanton
Directors

The Seed Savers' Network, Box 975,
Byron Bay, NSW 2481, Australia

Tel 02-6685 7560
Tel & Fax 02-6685 6624

Email addresses:
michel@seedsavers.net
jude@seedsavers.net

Website: www.seedsavers.net

Procuring medicinal herbs for the Australian market

Peter Purbrick

MediHerb Pty Ltd

As we approach the end of the millenium, there are three important considerations affecting supply of medicinal herbs:

- Unprecedented interest/demand for natural plant products/herbal medicine
- An alarming rate of loss of plant species.
- The majority of medicinal plants are harvested from wild plant populations.

In 1997 the International Union for the Conservation of Nature (IUCN) released results of a 20 year study, the most comprehensive scientific assessment to date on the status of the world's vascular plants. This study, known as the 'Red list of Threatened Plants', identified 12.5% (34,000) of the world's vascular plant species as being in danger of extinction. However, as only Nth America, Australia and South Africa were comprehensively covered, the figure of 12.5% is probably conservative. In the US, the most studied country, 29% of the nation's 16000 species, including important medicinal plants were identified as at risk of extinction. These facts probably account for the emergence of interest groups within the US in recent years, championing the cause of sustainability in use of wild medicinal plants.

In May 1995, the US Plant Conservation Alliance set out a framework with a number of strategies for developing a national co-ordinated approach to plant conservation. Within the strategy applying to the 'sustainable use of beneficial' plants, the following guidelines were identified:

- Develop scientifically based policy and guidelines for sustainable use of native plants for medicinal, cultural, aesthetic and economic purposes.
- Work with commercial interests that utilise native plant materials (eg nursery and pharmaceutical industries) to ensure that sound conservation practices are employed.
- Encourage horticultural development of native plants in demand, to take pressure off natural populations.

At about the same time another US grassroots membership organisation was formed -- United Plant Savers (UpS), 'devoted to protecting and replanting at risk native Nth American medicinal plant species and to raising public awareness of the plight of native medicinal plants' eg the UpS recently sponsored a CITES Goldenseal conference in Anaheim, California.

It is interesting to look at the source of botanical raw materials in commerce. MediHerb presents a range of single herb extracts derived from wildcrafted, organic and trade herbs. The 'trade' classification covers botanical raw materials sourced from importers or directly from foreign exporters where the original source is unknown, or difficult to identify, due to the number of intermediaries along the supply chain. However, over a number of years we have established communication with suppliers close to the source in countries of origin, and from these connections have found that many of these trade medicinal herbs originate from wild plant populations. These observations are supported by findings of an important recent study in the trade of medicinal plants in Germany (1). This study identified approximately 1500

medicinal plants imported into the country, of which only 20% are known to be cultivated, with less than 10% always obtained through cultivation. Given these figures, I was a little puzzled recently, with the claim of a large European manufacturer, that 70% of its extract production derived from cultivated medicinal plants. Closer examination revealed, that these figures derived from the quantity of herb processed, not to the number of plant species. In other words, a few cultivated species made up a high proportion of the total raw material used.

An important aspect in a consideration of wild plant usage is to appreciate the importance of distinguishing between plant species endemic to and contained within one bioregion and those that have naturalised outside the original bioregion eg. St Johns Wort. Potentially at risk plants are likely to be endemic to and have a limited distribution within one bioregion.

Apart from issues relating directly to plant conservation, one also has to consider the socioeconomic aspects of the trade in wild medicinal plants. Collecting wild medicinal plants is very often the work of the poorest and most marginalised groups in various countries where it is undertaken, eg in East and Southeast Europe the Gypsy people are traditionally the harvesters of medicinal herbs. Any analysis of sustainability in the supply of medicinal plants is often symbiotically linked with the economic/social health of marginal ethnic or socio-economic communities. Therefore the ethical issues are not simply about destruction of a natural resource, but also about economic exploitation of often powerless minority socio-economic communities.

For North American botanicals, MediHerb has over the years developed relationships with suppliers who appreciate the concept of wildcrafting, a term that implies sustainable harvesting practice. 'Wildcrafting, is to harvest plants growing wild in nature, from unpolluted areas with regard to balance, in a way that does not threaten the full survival of the plant species. The essence of wildcrafting is harvesting wild plants in a manner that increases their number and health'. (2)

Nevertheless despite these noble sentiments, there is emerging today as a result of increasing market demand, a sense that sustainable wildcrafting is difficult to achieve. Sometimes plants do not respond to disturbance and attempts at regeneration are unsuccessful. Given this reality and the increased amount of wildcrafting, plant populations may be negatively impacted. Hence the prohibition of export (from the USA) of wildcrafted goldenseal, and in some states a prohibition on the wildcrafting of *Echinacea angustifolia*.

The United Plant Savers (UpS) have compiled two lists of commonly wild harvested North American herbs used in commerce:

At Risk list: 'herbs which due to overharvesting, loss of habitat or by the nature of their innate rareness or sensitivity are at risk or in significantly declined numbers within their current range'.

To Watch list: 'herbs about which there is concern and for which information is being gathered'.

One difficulty with these lists is that they can be used to generate 'misinformation' about the 'at risk' status of a particular herb. Examples of the potential for misinformation are: Kava (*Piper methysticum*), listed as 'at risk' in Hawaii only, however there are well-established plantations of Kava in Hawaii. *Mahonia spp* is

- *Uncaria tomentosa* - Recently, export from Peru was banned. This was a temporary hold while the Peruvian authorities put together protocols for managing the resource.
 1. Export of raw material from natural growth forest is banned. Harvesting is still allowed but only for the preparation of value added products in Peru for both domestic and export markets.
 2. Export is allowed from reforestation areas.
 3. Export is allowed from plantation areas, and there are now a number of plantations established in Peru.
- *Harpagophytum procumbens*:- sourced from an English company involved with a new innovative project for sustainable harvesting. Devil's Claw (*Harpagophytum procumbens*) mainly grows in the Kalahari sands of Namibia, Angola, Botswana, and South Africa, and is intricately part of the culture of the Bushmen people in those regions.

The plant has a primary taproot and secondary tubers, plant regeneration necessitates the harvesting of the secondary tubers which also contain the optimum levels of the active constituent; harpagoside, in high demand by the natural herbal/pharmaceutical industry.

Trade in Devil's Claw is generally highly exploitative of the people who harvest it. (3). The low prices paid, encourage harvesters to pull out whatever is available to maximise their returns; primary and secondary tubers and even tubers of other species which negatively effects the final quality of Devil's Claw available in the market. Such unsustainable harvesting practices not only damage the natural resource and are economically exploitative of the peoples who harvest it, but also result in a relatively poor quality final product.

The Sustainably Harvested Devil's Claw Project, started with one community in 1997 and now has a number of communities involved. Supported by the Canada Fund for Local Initiatives, the project aims to demonstrate how environmentally sustainable practice can be combined with fair trade and community control, to produce high quality, competitively priced product.

Specific objectives are as follows -

- to demonstrate the viability of sustainably harvested Devil's Claw as a long term resource to marginalised communities to whom the practice is culturally acceptable
- to enable a pilot community to earn a reasonable income from the sustainably harvested Devil's Claw
- to demonstrate that sustainable harvesting practices will lead to better managed natural resource.

Areas harvested have been examined and certified as organic by the Soil Association (UK).

The accompanying tables by demonstrating the increasing quantities of medicinal herbs being delivered by Australian growers in recent years clearly show that medicinal herb growing in Australia is taking off. There is however, a lot more to be achieved, in terms of improved plant breeding, cultivation practices, harvest and post harvest handling, to maximise levels of active constituents. Also, there is a lot to be

listed on the 'to watch list', however, the species in commerce, *M.aquifolium* although rare in some areas of its bioregion, is found in abundance in other areas.

The lists deliberately record some plants by genus only where it is believed the correct species for commerce is not always selected. However, this approach can be misconstrued to generate an impression that an entire genus is at risk, when this is not necessarily the case. Examples of this are:

Echinacea spp is listed due to concern for the *E.angustifolia* and other rare species.
Drosera spp listed due to concern for *D. rotundifolia*.

As a result of these lists, there is a gathering momentum against the use of wildcrafted plants. In reality, in the absence of regulation, wildcrafting will continue as long as this is a cheaper alternative to cultivation. To move away from using endangered or wild harvested plants, there needs to be regulation in conjunction with education of herbalists and consumers for the necessity that medicinal herbs be supplied from sustainable sources, ie through cultivation.

In response to growing concern about potentially endangered plant species, MediHerb has adopted the following Policy for Endangered and at Risk Herbs:

- Not to trade in banned herbs eg Sundew (*Drosera rotundifolia*)
- Not to trade in wildcrafted endangered herbs if there are alternatives eg *Pygeum*
- To actively phase out the use of other wildcrafted endangered herbs by encouraging cultivation eg Goldenseal
- To encourage cultivation of at risk herbs eg Devil's Claw, *Echinacea angustifolia*, Cat's Claw, False Unicorn, *Arnica montana*
- In the process of encouraging cultivation, to build in a better quality product through better selection of varieties, cultivation methods, drying and post-harvest handling.

Specific examples of at risk herbs which have been handled to date are:

- *Cypripedium pubescens* - ceased usage
- *Prunus africanum* - ceased usage. Reformulated a popular product with alternative herbs.
- *Arnica montana* - supplied from harvesters in France who must meet regulatory requirements controlling the harvesting of this herb.
- *Gentian lutea* - Currently working with a supplier who has buys from a controlled wild source in France, which has been certified as organic.
- *Echinacea angustifolia* - in the past there was blatant substitution, with *Parthenium integrifolium* being sold as *E.angustifolia*. Due to pressure on the wild resource, it is now difficult to ascertain that all wildcrafted herb is supplied from 100% of the correct species as evidenced by variable and relatively low levels of active constituents. Now also there are harvesting prohibitions in certain states eg Montana, Nth Dakota. MediHerb is now procuring organically grown *E. angustifolia* from New Zealand and next year from Australian producers. Testing to date has shown that Australian and NZ root has high levels of alkylamides.
- *Hydrastis canadensis* - now subject to CITES, with all export from US of wildcrafted material prohibited. MediHerb is working with a US supplier to procure cultivated Golden seal, the first shipment of which is in transit.

learnt about cultivation of wild 'at risk' plants not currently in cultivation ie. Black Cohosh, False Unicorn root.

MediHerb is committed to the development of long term strategies that will see substantial growth in a number of market areas with new and innovative herbal products. Commercial prosperity in these areas will go hand in hand with the development of a sustainable ethical supply of best quality medicinal plant materials.

References

1. 'Trade Survey of Medicinal Plants in Germany – A Contribution to International Plant Species Conservation'. D. Lange and U. Schippmann. Published by:- German Federal Agency for Nature Conservation, 1997.
2. Rocky Mountain Herbalist Coalition circa 1991:-
3. 'Sustainable Harvesting of and Fair Trade in Medicinal Plants:- The Case for Devil's Claw' – James Leith, Project Co-ordinator, CRIAA SA – DC. 1998.

Peter Purbrick
MediHerb Pty Ltd
August, 1999.

Note: Accompanying slides shown at the Conference are reproduced on the following three pages (ed.)

Ten Leading Exporting and Importing Countries of Medicinal Plants, 1992-1995

Exporting Country	Volume (tonnes)
China	121,90
India	32,60
Germany	14,40
Singapore	13,20
Egypt	11,25
Chile	11,20
USA	10,15
Morocco	6,85
Mexico	6,30
Pakistan	4,80

Importing Country	Volume (tonnes)
Hong Kong	77,25
Japan	43,50
Germany	42,80
USA	35,00
South Korea	27,35
France	15,95
Pakistan	12,00
Italy	9,50
Singapore	7,30
China	7,20

NHAA
MEDICINAL PLANTS FOR THE FUTURE
 Sustainability and Ethical Issues
 13-14 August 1999

The situation at end of this millennium

- Unprecedented interest/demand for natural plant products/herbal medicine
- Alarming rate of loss of plant species
- Most medicinal plants are from wild plant populations

MEDI  HERB

MediHerb's policy for endangered and at risk herbs

- Not to trade in banned herbs, eg Sundew (*Drosera rotundifolia*)
- Not to trade in wildcrafted endangered herbs if there are alternatives, eg Pygeum
- To actively phase out the use of other wildcrafted endangered herbs by encouraging cultivation, eg Golden seal
- To encourage cultivation of at risk herbs, eg Devil's Claw, *Echinacea angustifolia*, Cat's Claw, False Unicorn, *Arnica montana*
- In the process of encouraging cultivation, to build in a better quality product through better selection of varieties, cultivation methods, drying and post-harvest handling

MEDI  HERB

Red list of threatened plants - 1997 - IUCN

34,000 of world's vascular plants (12.5%) in danger of extinction

29% of 16,000 species in USA in danger of extinction

MEDI  HERB

Plant conservation strategy

In May 1995, the US Native Plant Conservation Initiative (now known as the Plant Conservation Alliance) set out a framework with a number of strategies for developing a national (US) co-ordinated approach to plant conservation

- Conservation strategy applying to the 'sustainable use of beneficial' plants:
- Develop scientifically based policy and guidelines for sustainable use of native plants for medicinal, cultural, aesthetic and economic purposes.
 - Work with commercial interests that utilize native plant materials (eg nursery and pharmaceutical industries) to ensure that sound conservation practices are employed
 - When demand dictates, encourage horticultural development of native plants to take pressure off natural populations.

MEDI  HERB

Sustainable use of medicinal plants

The goals of United Plant Savers:

- Identifying the at-risk medicinal plants species
- Researching cultivation and propagation techniques of at-risk medicinal plants - the research program for 1999 included projects on Golden Seal, Ginseng, Black Cohosh, Slippery Elm
- Securing and operating botanical sanctuaries, places to learn about at-risk medicinals, places that act as seed and plant material repositories and places to carry on research into sustainable cultivation techniques

MEDI  HERB

Sustainable use of medicinal plants (contd)

- Replanting and restoring at-risk medicinal plants by grass roots efforts
- Consulting with those growing and harvesting medicinal herbs regarding sustainable land practices
- Raising public awareness of the current plight of threatened medicinal herbs
- Working with the natural products industry to bring awareness to all concerned

MEDI  HERB

NHAA
MEDICINAL PLANTS FOR THE FUTURE
 Sustainability and Ethical Issues
 13-14 August 1999

Herbs at risk in USA
(Ups 'At Risk' List)

<i>Aletris farinosa</i>	<i>Euphrasia</i> spp.
<i>Aristolochia serpentaria</i>	<i>Hydrastis canadensis</i>
<i>Caulophyllum thalictroides</i>	<i>Ligusticum porteri</i> , L. spp.
<i>Chamaelirium luteum</i>	<i>Lomatium dissectum</i>
<i>Cimicifuga racemosa</i>	<i>Lophophora williamsii</i>
<i>Cypripedium</i> spp.	<i>Panax quinquefolium</i>
<i>Dionaea muscipula</i>	<i>Piper methysticum</i> (Hawaii only)
<i>Dioscorea villosa</i> , <i>D.</i> spp.	<i>Sanguinaria canadensis</i>
<i>Drosera</i> spp.	<i>Trillium</i> spp.
<i>Echinacea</i> spp.	<i>Ulmus rubra</i>

MEDI HERB

Herbs at risk in Europe

Adonis vernalis, *Arctostaphylos uva-ursi*,
Arnica montana, *Cetraria islandica*, *Drosera rotundifolia*, *Gentiana lutea*, *Glycyrrhiza glabra*,
Gypsophila spp., *Ankyropetalum gypsophylloides*, *Menyanthes trifoliata*, species of Orchidaceae that are used in the production of salep, *Paeonia* spp., *Primula* spp., *Ruscus aculeatus* and *Sideritis* spp.

MEDI HERB

Specific examples of MediHerb's approach to endangered herbs

Cypripedium spp. (Lady's Slipper) - ceased use
Prunus africana (Pygeum) - ceased use
Arnica montana (Arnica)
Gentiana lutea (Gentian)
Echinacea angustifolia
Hydrastis canadensis (Golden seal)
Uncaria tomentosa (Cat's Claw)
Herpogophytum procumbens (Devil's Claw)

MEDI HERB

Herbal raw material purchased 1995, 1998

	1995	1998
	<u>55 tonnes</u>	<u>136 tonnes</u>
Imported (Organic, Wildcrafted, Trade)	83%	61%
Australian Grown (Organic, Conventional, Wildcrafted)	17%	39%
	<u>100%</u>	<u>100%</u>
Organic	28%	32%
Wildcrafted	48%	20%
Trade	24%	48%
	<u>100%</u>	<u>100%</u>

MEDI HERB

Trade herbs bought in 1998

Minimum 500 kg
 At least 3 times the quantity bought in 1995

Arnica	W	Ginger	C
Astragalus	C	Ginkgo	C
Bacopa	W	Licorice	C
Black Cohosh	W	Pau D'Arco	W
Celery	C	Paeonia	C
Chaste tree	W	Sage	C
Damiana	W	Schisandra	C
Epilobium	W or C	Wild Yam	W
Euphorbia	W or C	Yellow Dock	W or C
Eyebright	W	Zizyphus	C

MEDI HERB

Trade herbs bought in 1998, not bought in 1995

(Quantities ≥ 500 kg)

Grape seed/skins	C
Gymnema	W
Red Clover	C
Sarsaparilla	W
Stemona	C

MEDI HERB

NHAA
MEDICINAL PLANTS FOR THE FUTURE
 Sustainability and Ethical Issues
 13-14 August 1999

**Australian cultivated/wildcrafted herbs
 bought in 1998**

Minimum total amount 200 kg
 At least 3 times the quantity bought in 1995

Burdock	Ginger
Clivers	Lavender
Dandelion root	Lemon balm
Echinacea purpurea root (3000 kg)	Rosemary
Elecampane	Skullcap (6000 kg)
	St John's Wort (13000 kg)

MEDI HERB

**Australian organically grown/wildcrafted herbs
 bought in 1998, not sourced from Australia in 1995**

- | | |
|---|--|
| <ul style="list-style-type: none"> • Dandelion leaves • E. angustifolia root • E. purpurea whole plant • E. purpurea aerial parts • Globe Artichoke • Golden Rod • Greater Celandine • Horsethrust • Hyssop • Licorice • Marshmallow leaves • Meadowsweet • Motherwort • Nettle leaf • Nettle root | <ul style="list-style-type: none"> • Passionflower • Peppermint • Raspberry leaves • Rue • Sage • Sheep Sorrel • Shepherd's Purse • Spearmint • St Mary's thistle • Thyme • Valerian • Willowherb • Wood Betony • Wormwood |
|---|--|

* Herbs 100% sourced from Australian growers/collectors in 1998

MEDI HERB

**Other 'high' usage herbs (>500 kg/year) which
 could be investigated for cultivation in Australia**

Astragalus	C	Dong Quai	C
Baical Skullcap	C	Elder flowers	W
Barberry	W	Euphorbia	W
Buchu	W or C	Gotu Kola	W or C
Bupleurum	C	Gymnema	W
Calendula	C	Mullein	W
Chamomile	C	Sarsaparilla root	W
Chaste tree	W	Saw Palmetto	C
Damiana	W		

MEDI HERB

**"At Risk" medicinal herbs which could be
 investigated for cultivation in Australia**

>2000 kg/year	<i>Cimicifuga racemosa</i>
	<i>Dioscorea villosa</i>
>1000 kg/year	<i>Euphrasia officinalis</i>
	<i>Hydrastis canadensis</i>
300 - 1000 kg/year	<i>Arctostaphylos uva-ursi</i>
	<i>Arnica montana</i>
	<i>Helonias luteum</i>
	<i>Gentiana lutea</i>
	<i>Ruscus aculeatus</i>

MEDI HERB

**"At Risk" medicinal herbs which could be
 investigated for cultivation in Australia (cont)**

100 - 300 kg/year	<i>Asclepias tuberosa</i>
	<i>Caulophyllum thalictroides</i>
	<i>Rhamnus purshianus</i>
	<i>Trillium erectum</i>
<100 kg/year	<i>Aletris farinosa</i>
	<i>Baptisia tinctoria</i>
	<i>Ligusticum porteri</i>
	<i>Lomatium dissectum</i>
	<i>Menyanthes trifoliata</i>
	<i>Sanguinaria canadensis</i>
	<i>Stillingia sylvatica</i>

MEDI HERB

**Regulation of herbal medicines –
How government regulation affects the supply of plant materials for
medicinal use**

Michelle McLaughlin
Office of Complementary Medicines
Therapeutic Goods Administration
August 1999

Hello, and thank you for your introduction. On behalf of Dr Fiona Cumming, and all at the Office of Complementary Medicines at TGA, I would like to thank the organisers, the NHAA and Traffic Oceania, for the invitation to speak at the conference. It is a great opportunity to address some very important issues relating to the future availability, especially in Australia, of plant materials for medicinal use.

Well, why am I here today? I suppose that I have three main objectives that I would like to address.

Objectives

To address the perceived threats to the future supply of plant materials for medicinal "use"

Firstly, and foremost, the overall aim of the conference is to address the perceived threats to the future supply of plant materials for medicinal use.

To address perceived regulatory "threats" - and put them into perspective

I suppose, as a representative of the regulators, if you like, I'm here to address any perceived threat from government regulation. What I would really like to do is to outline the relevant legislation, and put it into context.

To outline potential threats relating to ethics and sustainability issues

Finally, I would like to highlight some of the issues that the TGA has identified relating to ethics and sustainability.

I have three main topics of discussion

Topics of Discussion

Therapeutic Goods Administration (TGA) and Therapeutic Goods legislation

Firstly, I would like to briefly look at the TGA and the reasons for the therapeutic goods legislation.

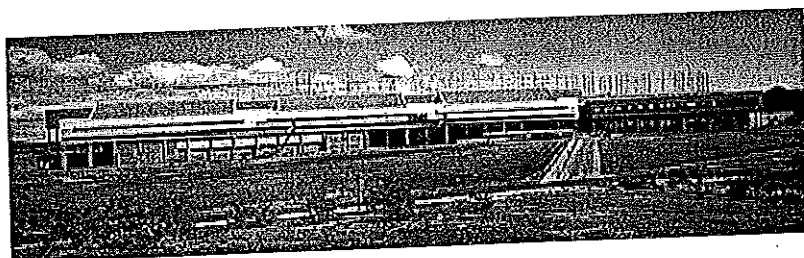
Regulation of herbal medicines

I would then like to go into a little more detail on how herbal medicines are currently regulated, and look at the reasons for this regulation

Ethics and sustainability issues

And finally, if time permits, I would like to draw attention to some of the ethical and sustainability issues that arise from the current regulatory system.

The Therapeutic Goods Administration (TGA)



Well, the Therapeutic Goods Administration or TGA! They say that giving a name and details to an individual helps to stop depersonalisation, so here are a couple of pictures. TGA is a division of the Department of Health and Aged Care, and is located in Symonston, which is in South Canberra. It is quite a large organisation, with a number of different branches and sections servicing a wide range of concerns relating to therapeutic goods.

Many issues relating to herbal medicines can be handled through the Office of Complementary Medicines. Other Sections that may be involved are the GMP audit and licensing section, the TGA laboratories, and (dare I say it) the Surveillance section.

I mention this because with the intended move towards greater post market vigilance as part of the recent reforms into the regulation of complementary medicines, surveillance, or "vigilance" if you like, will of necessity play a greater part.

Therapeutic Goods Legislation

The overall aim of the *Therapeutic Goods Act 1989* (the Act) is to ensure the quality, safety and efficacy of therapeutic goods available to the Australian public so that consumers can be confident in the medicines available to them. It is also important that medicines are available in a timely matter.

There are several pieces of legislation that affect the regulation of medicines including traditional or herbal medicines. The Therapeutic Goods Administration regulates medicines, but if the medicine is of human, plant or animal origin for import the Australian Quarantine Inspection Service (AQIS) also has jurisdiction.

If the medicine includes protected species, environmental protection legislation plays a part and if the medicines come from overseas, then Customs legislation comes into effect. Additionally, the Therapeutic Goods Administration recognises and supports the treaty signatory of the Convention of International Trade in Endangered Species (CITES) of wild fauna and flora.

Regulation of herbal medicines

Now we get to what I suppose I am really here for today - the regulation of herbal medicines. What are the "threats" to future availability of plant materials? Hopefully, in understanding the system, those of you who have considered government regulation as a potential threat to the future availability of plant material, may start to understand the principles behind the legislation, and why they have been put in place.

What we are ultimately about is to ensure that basic principle, the health of the Australian public. We need to be able to guarantee the safety, and quality of the herbal medicines that they utilize. And by "quality" I also mean reliability. But more to that later.

Regulation of raw herbs and/or starting materials

As many of you probably already know, raw plant material that is subject only to growing, harvesting and milling, is basically not regulated by the TGA, unless it is then packaged for supply.

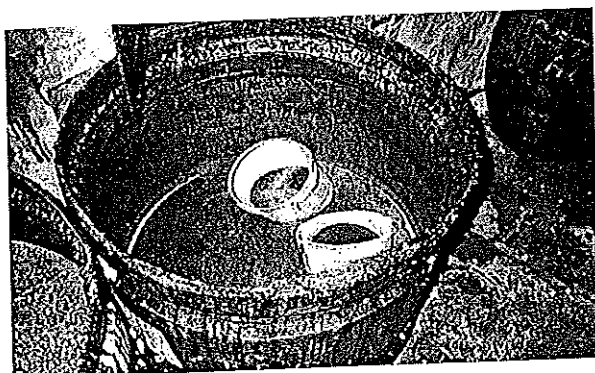
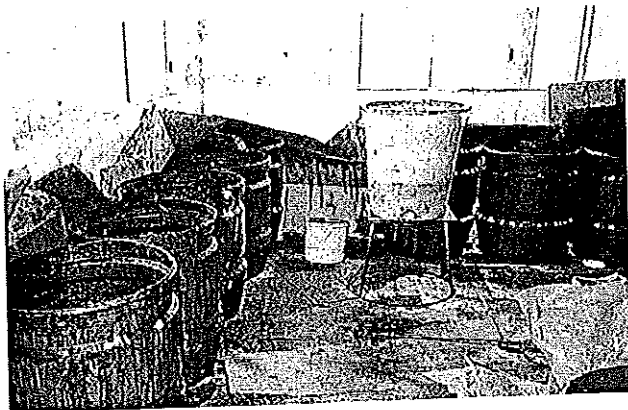
Of course that doesn't mean to say that basic quality control measures shouldn't be put into place. As a quality supplier, one may be expected to be able to ensure the authenticity of the botanical species used, the optimal growing conditions (where controllable) for the plants, and of course optimal or at least consistent harvesting times. These are all factors that will contribute towards quality medicines, however they are not factors that the TGA itself regulates.

Within Australia, those herbs that are further processed, are generally required to have such processing undertaken by a manufacturer with a suitable GMP, or Good Manufacturing Practise, license.

Unfortunately, a current inequity in the system is that extracts or "starting materials" manufactured overseas and intended for inclusion in Listed goods, are not directly subject to this GMP. This is especially of consequence to Australian suppliers when cost and quality considerations are taken into account. But again, more of this later.

Well, why is this regulation required in the first place one may ask? I have actually borrowed some pictures from the GMP Audit and Licensing Section for this one. Now I must stress that these are "old" pictures and the manufacturers involved have since tightened up and now hold GMP licenses. But as you can see, there is no control over factors that could be controlled to limit contamination by animals, bacteria, extraneous material or even just mix up or cross contamination between batches.

Even today I occasionally get calls from would-be manufacturers who cannot understand why the TGA has problems with them mixing up say a wound ointment in their bathroom. It may be the microbiologist in me, however as a consumer I get shudders when I hear that these people often do not have even a basic understanding of infection control.



Now, before anyone shoots me on the podium, you may argue, and probably quite rightly, that I am using extreme examples here. I am. However our current system does have to manage these extremes. And unfortunately we often find out about them when someone gets hurt. So until someone comes up with a better way, that is workable for everyone it is, I would argue, in the interests of the industry as whole to ensure that what is produced is of high quality, in the GMP sense at the very least.

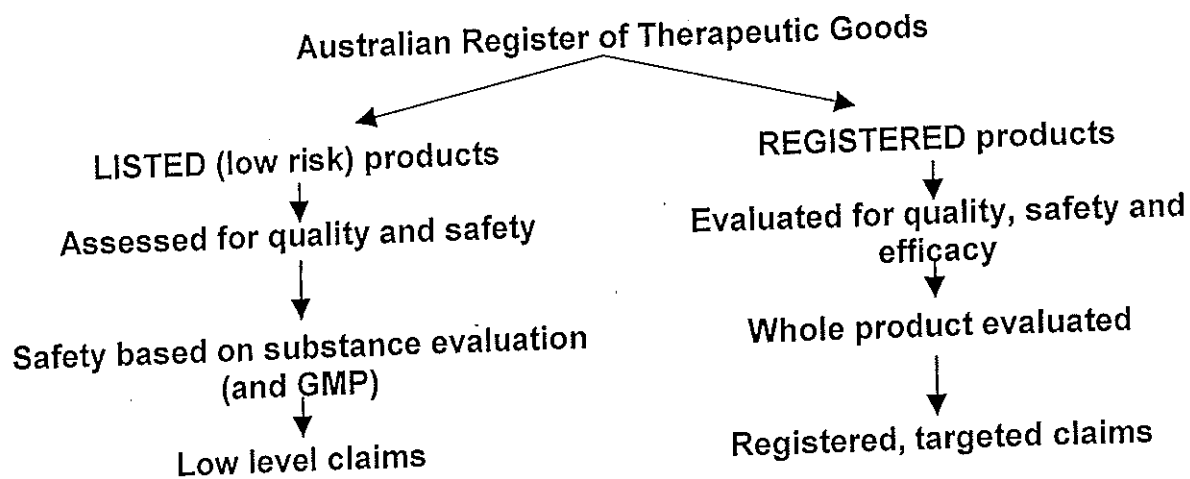
I have also heard it argued that the current requirements are too prescriptive. It is true that the GMP system was originally put in place with pharmaceuticals in mind. Now there are different categories of GMP licenses (examples). I must admit that this isn't my area of expertise, however again, if we keep in mind that "level playing field" idea, we are looking at medicines that are consumed. Whether they are pharmaceuticals, phyto-pharmaceuticals or herbal tablets, many principles remain the same, and hence the similar requirements.

Remember, we can work together to ensure that the system implemented is fair and equitable, whilst still ensuring safe, high quality products.

Regulation of listable herbs

Many, many herbs are eligible, or permitted to be included in listed, over the counter remedies, providing a few conditions are met.

I suppose I should first give a quick over-view of the Listing/Registration system.



Thus Listed goods are those that have established low-risk ingredients and that are indicated for minor self-limiting claims. They can be sold over-the-counter, hence the term OTC. Those herbs which are of higher risk, whether because of the herb itself, or because of the claims being made, may be required to be included in registered goods.

Evaluation of "new" herbs

Now, what about those herbs which have not yet had "low risk" established. Thankfully, since the implementation of the Complementary Medicines Evaluation Committee or CMEC, in December 1997, there is a mechanism for evaluation of new complementary medicine substances, herbal or otherwise.

The implementation of the CMEC means that there is now a way to address the issue of "timely availability" of what we sometimes consider "new herbs" (despite of course the fact that they have often been used in some cultures for hundreds, if not thousands of years). They are new in the sense that they haven't previously been supplied in therapeutic goods in the Australian marketplace.

There are a number of ethical issues that arise from the over-the-counter availability and use of herbs traditionally supplied within a particular system of medicine, and supervised by what really amounts to a "trained practitioner", be they shaman or traditional herbalist.

Just remember that providing that the "new" herb is not subject to restrictions such as those outlined in the State or Territory poisons legislation (either itself or due to a component it contains), it may still be able to be obtained via a herbal practitioner. Of course where the safety profile of the herb is not fully established, this may be the safest course of action, as the practitioner can observe the herb's effects and modify treatment accordingly.

Practitioner exemptions

I must also briefly mention practitioner exemptions. There is provision in the legislation for practitioners to extemporaneously compound or dispense remedies (including herbal) without these remedies being included in the Australian Register of Therapeutic Goods (ARTG), and also to manufacture their own remedies without being subject to GMP. There are specific requirements for this, however due to time limitations it may be better for those interested to question me about this later.

Ethics and sustainability issues

Finally, I would like to briefly outline some of the issues relating to ethics and sustainability, which have been identified over time by the TGA.

I suppose whenever health meets business, or indeed health meets politics, there are a number of ethical issues that arise.

Ethics

Firstly, bringing herbs into the country. Besides the obvious AQIS issues such as pests, diseases and such, there are quality issues such as

- Have they been identified properly? (mis-identification and substitution issues) This is especially a problem when the herb has been processed to an extract or even a powder.
- Do we know how viable the ingredient is? ie how long has it been stored, or even how long was the herb stored before it was processed?
- What was the quality of the herb used in the first place?

When I first studied herbal medicine I remember one of my teachers bringing in a bag of fresh, vibrantly coloured, aromatic herb, which contained almost exclusively leaf I think in this case. We then compared it to another bag of the same herb, which was dull in colour, hardly smelt at all, and was full of chaff. Her point was: "Which would make the best final product?"

There is also the question of locally grown, organic produce. Surely herbs grown locally can be quickly processed to make the more potent remedies! Unfortunately, price does come into this. Manufacturers and sponsors are businesses. However, one may well be concerned when obtaining the cheapest extract over-rides establishing the quality of the material used.

The use of standardised and highly concentrated extracts

- Now there are obviously a lot of benefits to these, not to mention the research that they are currently generating.
- There are ethical concerns relating to both the piggybacking on research of those herbal remedies which do not really contain the same substance, or even recommend the dosage shown to have been effective in research,
- As well as concerns relating to establishment of safety. Is it fair for a highly processed extract, often with a significantly different chemical profile to the herb it was originally derived from, to claim low-risk status based on tradition of usage? They may well be safe, but they are really new substances. Just something to think on.

Sustainability

- "Faddy" herbs and global supply. What happens when a herb becomes popular? When supplies run out, what happens? Are we driving some herbs onto the endangered species lists eg *Hydrastis* and *Panax*?
- Should we be looking at local alternatives, and if we do, what are the concerns that then have to be considered?
- Long term benefits for the industry (quality). If we want to sustain the industry as a whole, we need to look at long term credibility. Rubbish now will only help ensure contempt from the conventional medical fraternity, and disillusionment of the consumer.
- Consumer views of herbal medicines - please don't take advantage! I know of a number of people personally who have been put off herbal remedies because they have obtained poorer quality remedies (with regard to potency of ingredients used and poor dosage regimes).

Conclusion

I really believe that there is a place for herbal medicines in the future of Australian medicine.

Australia can be a world leader in supplying safe, quality remedies to the rest of the world

We can all work together to formulate strategies for dealing with the problems that arise relating to ethics and sustainability.

Remember that there are reasons for the regulations. The ultimate safety (and quality) of the remedies is of major priority.

And for all of you who sometimes wonder whether mainstream medicine will ever accept herbal medicine, think of the recent achievement of the NHAA in achieving GST exempt status for herbalists and remember:

"Yesterday's alternative is today's fringe and tomorrow's mainstream"

Which I suppose in terms of herbal material means that we have probably nearly come full circle. I am sure that we can all work together to ensure the continued availability of plant materials for medicinal use, the continued health of our nation, and of course the sustainability of the plant kingdom from which we receive these riches.

Michelle McLaughlin

Traditional Medicine, Environmental and Resource Management: an Indigenous Perspective

Carol Ridgeway-Bissett
Maniagal Aboriginal Heritage Inc

For thousands of years, Aboriginal people have been involved in sustainable land, marine and resource management. "Looking after country", is an accepted and shared responsibility. A moral obligation embodied in Traditional law and passed on from one generation to the next. Central to environmental and resource management is traditional ecological knowledge which includes the utilisation of fire as a tool.

Fire technology was and still is an integral part of environmental management and adaptation. Understanding fire technology was much more than the concept of Aboriginal people living in harmony with the environment and all species. It was a cultural tradition that was a highly significant and selective process in burning practices. These practices influenced productivity, diversity, distribution and abundance of flora and fauna. Fire was also used as a tool in the maintenance of walking trails, cultural sites and in religious symbolism and social life (see diagram page 45).

Health and Well-Being

Aboriginal people's holistic approach to health involved the prevention of ill health or treatment of different illnesses. Cultural knowledge of the nutritional content of food sources and the medicinal properties of species was quite comprehensive and detailed.

The removal of toxic properties, cooking methods, food and medicinal preparation, and the availability of resources, location, distance, value, content and consumption contributed to the health and well-being of individuals or the community.

Herbal Medicine

Indigenous herbal medicine encompassed a vast and diverse range of terrestrial and marine flora and faunas. This knowledge evolved over thousands of years of experimenting with different sources or products and was an ongoing process. Common complaints associated with ill-health in traditional society were animal and insect bites or stings, muscular aches and pains, burns, colds, coughs, cuts, wounds, sores, digestive complaints, diarrhoea, dysentery, fever, headaches, toothache, sore eyes, bruises and ear aches.

Treatment of many ailments comprised such techniques as inhalation, steam baths, smoking, infusions and decoctions, external or internal, herbal teas, food consumption, ointments, medicinal body wash, lotions, liniment, charcoal, chewing, wood ash, pastes, fresh water and salt water. Fruit, seeds, plant stems, roots, bark, sap, gum, nectar, the whole plant of some species, fungi, clay, termite mounds, sand and mud, all were part of Aboriginal traditional medicine.

The European invasion and colonisation

With the European colonisation of Australia, Aboriginal people experienced the breakdown of traditional society through cultural genocide, dispossession of traditional land, hunting,

gathering and fishing areas. Faced with the introduction of exotic species, land degradation, depletion of resources, the destruction and degradation of sites and the exploitation of culture and resources, Aboriginal people were given no choice but to be absorbed into an alien culture. Prior to the European invasion Aboriginal people had maintained successfully the physical, social and mental capacity that ensures good health according to Dreaming law.

Exotic diseases and ill-health

Exotic diseases had devastating effects on Aboriginal people and their traditional lifestyles. Loss of cultural identity, culture and heritage, and dispossession of land and resources, contributed to both physical and psychological ill-health.

Traditional healers and medicine

Aboriginal Australians still retain knowledge of culture, food, medicine, environmental and resource sustainable management practices, however new methods and techniques were sought by traditional healers which incorporated exotic species into Aboriginal herbal medicine for illnesses that were unheard of in traditional society. In contemporary society traditional medicine and scientific medicine are used to combat ill health.

Human Rights

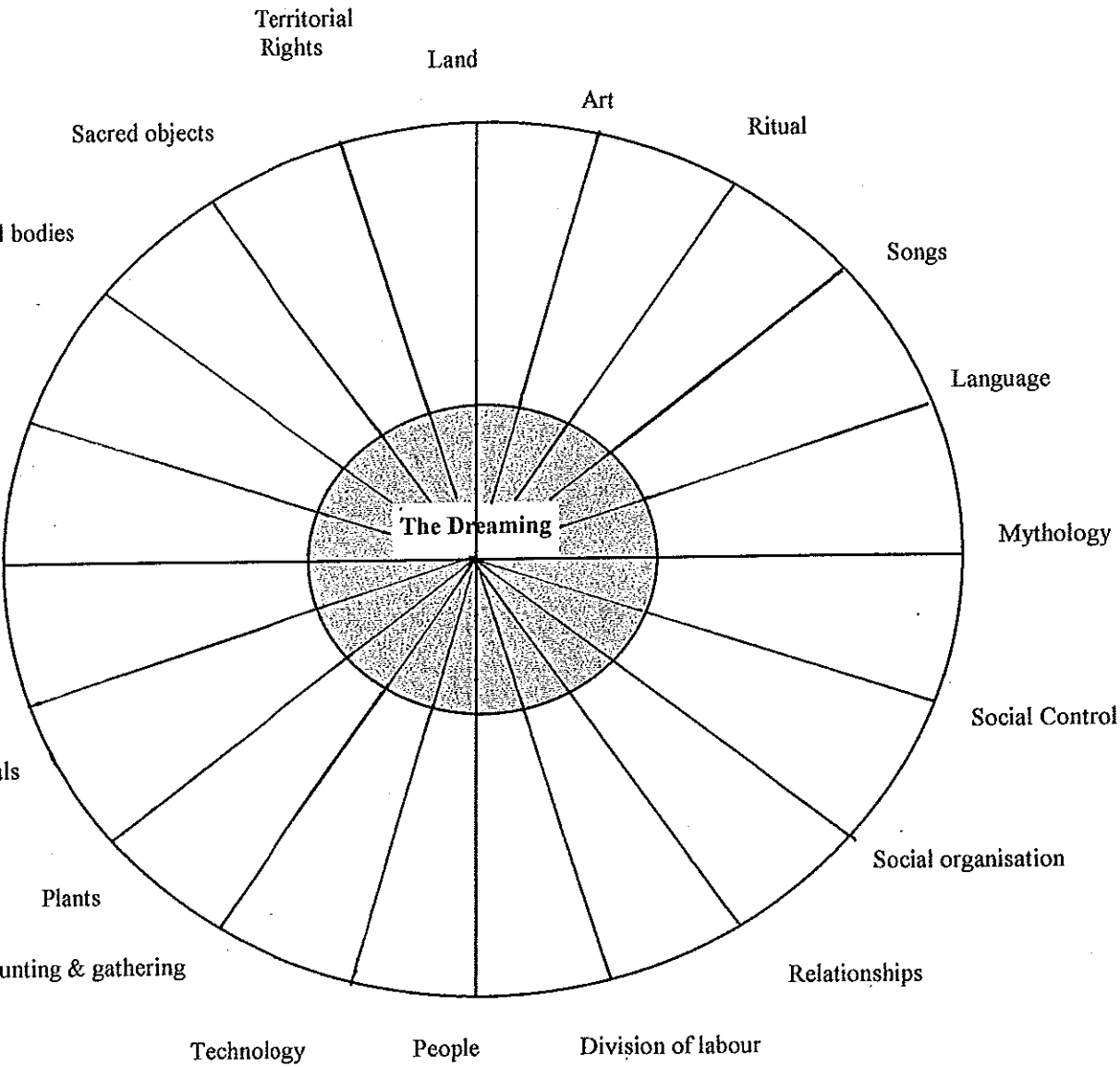
We strive as indigenous Australians for the revival of our culture and traditions, our identity as Australia's first people and the right to protect and conserve the environment, heritage and biodiversity. We demand our rights for decent housing, good health and intellectual property rights. We seek redress for the social injustices that have plagued our people, our traditional lands, culture and heritage. We seek social justice free from exploitation, the right to negotiation and consultation on indigenous issues. We reserve the right to be recognised as a culturally diverse and unique people whose culture has survived for thousands of years.

In conclusion, we demand the freedom to practice our culture and traditions according to traditional law.

Bibliography

- Aboriginal communities of the Northern Territory of Australia (1998), *Traditional bush Medicines: An Aboriginal Pharmacopoeia*. Green House Publications Northern Territory.
- Coombs HC (1994) *Aboriginal autonomy: issues and strategies*. Cambridge University Press, Melbourne.
- Goldsworthy K. (1998) in Edwards WH. (eds): *An introduction to Aboriginal Societies*. Angus and Robertson, Sydney.
- Kohen JL (1995) *Aboriginal Environmental Impacts*. University of New South Wales Press Sydney.
- Lawlor. R. (1991) *Voices of the First Day: Awakening in the Aboriginal Dreaming*. Inner traditions International, Vermont.
- Low T. (1990) *Bush Medicine: A Pharmacopoeia of Natural Remedies*. Collins/Angus and Robertson, North Ryde.
- Low T. (1989) *Bush Tucker: Australia's Wild Food Harvest*. Angus & Robertson, North Ryde.
- Nathan P, Leichleitar (1983). *Health Business*. George Allen & Unwin, North Sydney.
- Resper SP. (1991). *Aboriginal Mental Health: Conflicting Cultural Perspectives*. In Reid J and Trump F (eds). Harcourt Brace Jo Vanovich, Sydney
- Oral Reserarch Ridgway-Bissett C. (1998). Maaingal Aboriginal Heritage Inc.

THE DREAMING CIRCLE



The dreaming is the basis of all aspects of life in traditional societies
Design layout—Keith Goldsworthy

Carol Ridgeway- Bissett (cont.)

Table 1. Indigenous flora for medicinal use

Botanical name	Common name	Traditional use
<i>Alphitonia excelsa</i>	Red ash	Headaches, pain, sore eyes
<i>Amyema spp.</i>	Mistletoe	Coughs and colds
<i>Avicennia marina</i>	Grey mangrove	Boils, ringworm, marine stings
<i>Eucalyptus spp.</i>	Gum tree	Coughs, colds, dysentery, wounds
<i>Melaleuca spp.</i>	Paperbark	Colds, fever, sinus
<i>Persoonia falcate</i>	Geebung	Colds, fever, eye drops, sore throat
<i>Pittosporum phillyraeoides</i>	Weeping pittosporum	Cramps, pain, eczema, pruritis, galactagogue
<i>Omalanthus populifolius</i>	Native bleeding heart	Bleeding

Table 2. Alternative techniques for the treatment of ill health

Sap	Gum
Bandages	Mouth wash
Bark	Oil
Charcoal	Ointment
Drinks	Herbal teas
Eye drops	Phyllodes
Flowers	Powder
Fruit, pulp and seeds	Resin
Inhalation	Smoke treatment
Leaves	Tonic
Linament	Wood ash
Medicinal wash	Steam inhalation
Lotion	Steam baths
Pastes	Nectar
Salt and fresh water	Mud
Clay	

Table 3: Methods – external and internal healing practices

Carminative	Germicide
Chewed leaves	Infusion
Decoction	Lactagogue
Diuretic	Mouth wash
Embrocation	Gargle
Emmengogue	Oral contraception
Emetic	Poultice
Emmolient	Purgative
Expectorant	Sedative
Febrifuge	Steam distillation
Food, gum or	Styptic
Clay consumption	Tonic
Fumigation	Vermifuge

Table 4. Fauna for medicinal use

Dugong	Infections, skin cleanser, moisturiser
Emu	Chapping
Goanna	Insect repellent
Porcupine	Weeping sores
Snake	Cuts, wounds
Turtle	Skin and hair moisturiser, cleanser
Witchetty grubs	Burns, wounds
Fungi	Sore throats, coughs, teething rusks, baby powder

MEDICINAL PLANTS FOR THE FUTURE

SUSTAINABILITY and ETHICAL ISSUES.

**Friday 13 - Saturday 14 August 1999
Byron Bay Beach Club, Byron Bay, NSW**

R.E.MCGOWAN

Friday 13:

SESSION 3:

**Preservation of traditional knowledge and
Intellectual Property rights.**

Saturday 14:

SESSION 1:

**Progress in New Zealand: Treaty of Waitangi
Claim 262.**

INTRODUCTION:

I propose to treat the two presentations I am to make at this conference as being parts one and two of the one paper. My focus will be traditional Maori medicine, *rongoa Maori*, the current situation in New Zealand as it relates to the theme of the conference.

In the first part I will outline the current situation in New Zealand with regard to the retention of traditional knowledge, in particular with regard to medicine and its practice by traditional healers.

The initial focus will be the retention of traditional knowledge and its transmission to the next generation of healers, at the end of the twentieth century. I will also outline the growing difficulties in accessing the plants needed by healers.

The focus will then shift to the particular concerns that Maori have with regard to the protection of their intellectual property in the face of growing interest by non Maori, particularly in the commercial opportunities that some traditional Maori medicines may have.

The Saturday presentation will deal with expression of these concerns in Wai 262, the claim placed by some of today's traditional Maori healers to the Waitangi Tribunal.

I will begin by giving an outline of the Treaty of Waitangi, and the history and role of the Waitangi Tribunal. This will lead to a discussion of Wai 262 itself, its content, the reasoning behind the claim, the expectations of those who placed it, and some of the legal challenges in addressing the claim. This will lead to comment on the implications to non Maori who have an interest in New Zealand's flora and fauna, particularly its use in traditional Maori medicine.

The paper will end with some suggestions towards a positive response and resolution to the situation outlined in the claim, currently being quietly initiated in New Zealand.

My main aim will be to make a New Zealand contribution to the conference. It is important to note that I am not Maori, nor am I a scientist. I will be speaking primarily from the perspective of a person who has been taught traditionally by elders from the Wanganui River in the Central North Island of New Zealand and who has

worked with traditional Maori medicine for more than twenty five years. My special involvement over the last ten years has been as a teacher, to help ensure the retention of traditional Maori medicine, working especially as a link between traditional healers and those who want to learn from them. My involvement as a regional Conservation Board member, my work at the University of Waikato, and growing involvement with herbal medicine has given me a broad perspective and a wide network amongst those involved in the different aspects of the questions under discussion at the conference.

I very much support thinking behind this conference. The fact that we are involved, each in our own way with herbal medicine does also make us responsible for its well being. We do need to be concerned at gaining an understanding of the impact of our practice on the plant resource we rely on, particularly on wild populations of medicinal plants. The ethical questions that are currently becoming more prominent, and intellectual property rights, are also our concern, as herbal medicine grows and we look to the knowledge and experience of other peoples to broaden our own practice. Of particular concern in this paper is our relationship with traditional healers and the medicines they have developed. Rather than focusing on the obstacles that can arise, or seeing them as resources to be tapped, we need increasingly to understand that they are fellow practitioners, like each of us, working in their own environment and in the context of their own cultures, for the benefit of those that they, and we serve.

Because of our involvement with herbal medicine we need to to the fore in finding solutions to the many issues that are current. By working together, as the conference suggests, by pooling our knowledge and experience, we have in our hands a very positive way to achieve real progress.

I will particularly be raising issues raised by Maori in a New Zealand context. I do realise that this is part of a much broader context; it is something with which indigenous people throughout the world are increasingly concerned. I hope what I have to say is seen as a positive contribution.

PRESERVATION OF TRADITIONAL KNOWLEDGE AND INTELLECTUAL PROPERTY.

INTRODUCTION:

THE ORIGINS OF RONGOA MAORI.

Rongoa Maori, traditional Maori medicine, like most or even all traditional medicines, developed out of the relationship of Maori with the world in which they lived. The key to their survival was their understanding of that world, and their relationship to it. That was particularly the case in New Zealand: Maori had come from a tropical island; the much colder climate of the new land they made their home meant that they had to adapt rapidly and drastically. This applied to all aspects of their life, including their development of medicine. Many of the plants they found in New Zealand were related to species they knew in the islands - kawakawa for instance is a member of the Piper family - but the majority were completely new. Maori developed the medicines they needed as they came to know them. How they did this is worthy of comment, but is outside the scope of this paper. It well to note that being such an isolated population Maori had very few diseases and much of their medicine revolved around childbirth and caring for the injuries from work or warfare.

That ability to adapt was, and remains, one of the special qualities of Maori.

Further major changes were required when the first Europeans came to the country at the end of the 18th century. Not only did the newcomers bring a new culture with its own technology, medicine, etc., they also brought a number of new diseases. This led to major developments in the practice of traditional medicine.. The rapid adaptation that took place was by no means unique to Maoridom. Wade Davis, in his book "One River" on the exploration and discoveries in the Amazon noted the wide differences, between a tribe who had no history of contact with outsiders and one who had been in contact with outsiders for some considerable period of time, in herbal practice and the number of plant species used . The exposure to new diseases demands rapid development to cope with the challenge they bring. That happens everywhere. Again, it is a matter of survival. These peoples that don't adapt eventually disappear.

However the coming of the European also signaled a major loss of confidence by Maori in their own medicine. The fact that the Pakeha (European) had proved stronger than the Maori meant to

many that the Pakeha medicine, among other things, was also the stronger, and therefore more preferable. There was also considerable pressure on Maori from the colonists to abandon their "primitive" ways. There was even an act of Parliament in 1908 which forbade the practice of traditional medicine.

Nevertheless, despite the negative environment rongoa Maori did continue to be practiced; in many cases it was the only available medicine, for both to Maori and Pakeha. The Maori were still a rural people, still living close to, or in the bush. It was within reach, and it was effective.

Migration to the Cities: how to retain traditional knowledge?

This situation was to change after the second World War. As industry began to develop in the cities more and more Maori, either voluntarily or by force, migrated to the cities to provide workers for the bold new developments. By 1991, 82% lived in towns or cities.

That has major implications for the retention of traditional Maori medicine. Among the key factors required are an in depth knowledge of the natural world, particularly of the bush, and a living understanding of the cultural foundations of the medicine. The question that obviously arises is how is the knowledge of traditional medicine going to persist when the vast majority of Maori are now urban born and raised, have little or no knowledge of the bush and its plants, and have often only minimal opportunity to come to know the culture and language of their ancestors. Many do retain close links with their home areas; they may visit often, they may learn the language and study the culture, but very few in fact have the chance to develop that in depth knowledge that is essential for the practice of traditional medicine.

There is no question of looking for somebody to blame. The simple fact is that if a person has lived all his or her life in town it is going to be very difficult for them to gain a knowledge of and appreciation of traditional medicine from their elders. They are not any less able; they have in fact developed a different set of skills and knowledge, more appropriate to their current circumstances.

This situation is, to my mind, the most daunting challenge for Maori in the retention of their traditional

medicine. There still are still a number of traditional healers working with the people, and some younger people learning from them. But increasingly the old experts are dying, and with each death a little more irreplaceable knowledge is lost. Almost all of the people who taught me, for instance, have long since passed away. I only captured a fraction of what they had to teach.

It must be remembered that rongoa Maori, like most of traditional Maori knowledge, was, and to a large extent still is, taught orally. In the past a trainee was expected to remember everything he or she was taught, without recourse to written notes. And there was much more to that knowledge than the detailed information that had been accumulated. There was another whole dimension, more on a spiritual level, that was essential, and was taught through the cultural environment in which the medicine was practiced. A written record may record information, accurately and in detail. But that extra dimension, the dimension that is the "soul" of the medicine, cannot ever be adequately committed to writing. It is a spiritual gift that is passed from one generation to the next. That gift not only safeguards the knowledge, but also guarantees its integrity.

How is all that retained when the physical and cultural environment out of which the knowledge has grown is critically disrupted by the migration into the cities? Maori will survive, as they always have. But will this part of their heritage survive in the new world of the 21st century? Do they want it to survive? Do they need it to survive? Much of the information about the medicine can be recorded, but in doing so is an essential ingredient lost? The impression I have is that most traditional healers think so.

This question highlights an area of misunderstanding between traditional practitioners and some modern herbalists. It would seem that most traditional Maori healers do not consider that Maori medicine is a herbal medicine. It certainly has a long established history of using plants for healing - herbal medicine - but that is one part of that practice, and not the most important part. I, for one can remember many times being called to order by the people who were teaching me for my questions on the use of plants for medicine. As far as they were concerned I was missing the point entirely. The foundation of Maori medicine was spiritual.

That statement does require some explanation. If time were available I would very much like to comment further. Each culture brings its own perspectives. Suffice it to say that for

Maori there is much more to illness than the physical symptoms. It is the the non physical dimension, or the spiritual, that holds the key to health and healing.

Maori are increasingly sensitive to questions from enquirers seeking information about plants traditionally used for medicine. There are two areas of particular concern.

Firstly, people who want to know about plant medicine may lack an understanding of the spiritual dimension of Maori medicine, what they refer to as "taha wairua". A person who is not spiritually based traditionally was not considered an appropriate person to be taught. Elders were very careful in their selection of who was to be taught. This was not out of any fear of commercial exploitation - that is a modern concern. For them knowledge had power, and in the wrong hands that power was not only capable of being misused, but it could prove to be harmful to the person who held that power. What was to stop the illness being transferred from the patient to the healer. A person who wanted to learn had to be tested or evaluated, to use a more modern term, to see whether they had the required qualities. That can take time, a lot of time, and that counts against many modern ways of researching.

Much more can be said about that. Hopefully enough has been said to illustrate the key point: Maori are very careful about "window shoppers", people who want to visit a culture and pick out only those things that strike them as having potential, and not wanting to stay to learn about them in the context in which they belong, in a way that Maori themselves see them, to learn in a way that will safeguard the values they represent and within the context they belong. o

The second point is particularly a major focus of this conference. As the written record of traditional Maori medicine becomes increasingly important **many Maori are becoming concerned at the loss of their own intellectual property.** Written knowledge is much more accessible. For example you can read the papers I have written for this conference, but you can't read the knowledge inside my mind. And as the knowledge becomes more accessible, the likelihood that it will be exploited becomes that much greater,

That does not necessarily mean that Maori are mainly conscious of the monetary profits that could be made from the commercial exploitation of their knowledge. That can be a factor, but once the

reality is looked at carefully it soon becomes obvious that the potential to earn substantial returns is seldom realised, and then usually only after considerable investment and some years of evaluation and testing. This is highlighted, for instance, in an article published in Nature magazine in 1998. (Vol 392, 9 April 1998). Herbalists may see more potential in traditional herbal medicines than the world's major drug companies, but nevertheless the opportunity of the sort of returns that are sometimes talked about seem seldom to be realised. To take an example from a different field, the returns to commercial growers of New Zealand's native garden plants are mainly in the number of jobs that are created, rather than personal profits to the individuals who head the various businesses involved. At a forum to discuss these issues last year at Waikato, Mark Dean, then national chairman of the New Zealand Nurseryman's association, demonstrated that very clearly. His nursery may have been producing more than 400,000 native plants each year, and that meant employing thirty or so people. But he and his wife would have earned considerably more if they had stayed school teaching.

What Maori, and no doubt other traditional cultures, are more concerned about is the loss of the opportunities that their knowledge can bring. Jobs for instance. Maori have a very high unemployment rate, they have lost most of their lands, the means to sustain themselves. On a very pragmatic level they do not like to see other people taking the knowledge that they have built up over many generations, taking the plants that they have cared for, etc., and using it to set up viable businesses, viable opportunities, while, as a people they slip more and more into the world of few opportunities and a growing and an increasing struggle to manage. As elders have put it: "They have taken all our land: now they want to take the ideas from out of our heads". If there are to be opportunities to be had, Maori expect their fair share of them.

Two further points warrant inclusion.

INTELLECTUAL PROPERTY ISSUES;

The whole area of intellectual property does raise the question of legal protection. That will be the focus of the second part of this paper, to be presented tomorrow. Suffice it to say that the Maori are certainly involved in establishing legal protection for their intellectual property. There are many dimensions to this. One of the issues that is particularly relevant

would like us to think about. After all, we must always keep reminding ourselves, it is their knowledge that we are talking about. They must always be our reference point, our guide. Losing touch with that can mean that we too can contribute to the injustices that seem so consistently to be the lot of indigenous peoples the world over.

There is much to be concerned about. Combined with the effects of urban migration, already discussed, we have a general situation which counts against the retention of traditional medicinal knowledge of the native plants. I am sure that one of the purposes of this conference is to come to grips with that reality.

CONCLUDING REMARKS:

There are many healers in New Zealand working with medicines made from New Zealand plants. Many of them are Maori, often working very much in accordance with the old traditions, as well as others, less traditional perhaps in their practice, but still calling on the traditional values and understandings that have always been the foundation of Maori traditional medicine. There are many who work full time as healers. As is Maori custom, most don't charge for their services; they work on a "koha" system in which each person contributes what he or she is able to offer. Often the healers struggle, but such is their belief in their calling, they continue to help where they may. That too is an essential part of the tradition, a part increasingly difficult in today's world. Because traditional Maori medicine has little formal recognition within mainstream health services, funding is not readily available, regardless of the quality of the services which are offered. That too is another challenge that tests the resourfulness of traditional healers and those who support them.

Increasingly non Maori herbalist are making use of New Zealand plants. To me this represents the coming of age of herbal medicine in New Zealand. My understanding of herbal medicine is that it is "medicine of the land"; we draw our healing from what the land offers us. In New Zealand that means more and more using New Zealand plants. This is happening much more, and it is good. Some Maori object; most don't. As I was told when I first began to learn: "Maori medicine belongs to those who need it. Who is going to deny a sick person something that they need?" It is also pleasing to see that many of the centres that teach herbal medicine do incorporate in various degrees, teaching about traditional Maori medicinal plants, and increasingly Maori are becoming involved

with them. Much more needs to be done in this regard, but a real beginning has been made.

The growing appreciation of the value of herbal medicine as an alternative to mainstream health services also contributes towards an environment supportive of the retention of traditional Maori medicine.

There is much about which to be hopeful. However, as a person involved for some ten years in teaching traditional Maori medicine I continue to feel that we are still losing ground. My biggest concern, already discussed, is that each year we lose so many of those who are very knowledgeable, and with them the knowledge that they have accumulated through a life time of experience. Because the world in which that knowledge was developed has almost disappeared it has hard to see that it can be replaced. People like myself have much to offer. But we are only bridges, links between those who want to learn and those who know. When it happens that we, the link people, become to be considered the experts, then we will know that we really have lost much of great value. I know how little know compared to the people who have taught me. So many others tell me the same.

If traditional Maori medicine is to continue to be available there is a lot of work to be done, urgently. More support especially needs to be given to those who continue the tradition. They should not need to struggle the way that most seem to, their practice compromised by the lack of the necessary resources. Link people like myself also need support. Too often we are constrained by having to conform to the requirements of a Government controlled system, the New Zealand Qualifications Authority, rather work under the direction of those to whom the knowledge we teach belongs. There would be lots of difficulties in setting that up, but the point needs to be made. Sometimes our modern way of doing things consistently gets it all back to front..

My hope that fora such as this conference will help to develop a positive environment for the retention and development of traditional Maori medicine, and of traditional medicines in other countries. The support that people like yourselves can give, is a considerable encouragement. Perhaps what we all can do most of all is help develop a situation which enables traditional healers to work to retain their own medicines. They do know what needs to be done. They do appreciate the support of people like ourselves to give them the space to enable them to do that.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE
13 –14 August 1999.

WILDCRAFTING and HARVESTING – PRACTICE and ETHICS

Andrew Pengelly

Summary of talk

Wildcrafting – wild herb harvesting – plays a small but significant part of the Australian herb industry. It encompasses harvesting naturalised plants or weeds as well as native indigenous species. The scale of the practice varies from individual herbalists who wildcraft for their own use to commercial operations on a medium to large scale.

In this talk I will suggest guidelines and protocols for sustainable harvesting, look at regulation, possible forms of wildcrafting certification and discuss the need for research and education.

1. INTRODUCTION

1.1. Definition

Wildcrafting is simply the practice of foraging or gathering wild plants. It is an American term that originally referred to the gathering of any wild produce including animal furs. More recently the word has been revived and is primarily used in the context of harvesting wild medicinal plants.

Wildcrafted herb – ‘To wildcraft’ means to harvest plants growing wild in nature, not cultivated, from unpolluted areas with regards to ecological balance, in a way that does not threaten the full survival of the plant species. The essence of wildcrafting is harvesting wild plants in a manner that increases their number and health. [Rocky Mountain Herbalist Coalition 1998].

1.2. Personal experience

My interest in wildcrafting goes back 20 years to my herb student days at the Southern Cross Herbal School when I went on regular harvesting expeditions and field excursions with Denis Stewart.

For the last 10 years or so I’ve lived in the Upper Hunter Valley – the main location of my wildcrafting exploits over the years. Here I’m fortunate to have access to unpolluted harvesting areas around Merriwa and the Liverpool Range. At the ‘field school’ site at Burnbrae, areas of remnant bushland abound, hills clothed with stringy bark trees, hopbush and other native species, with a variety of habitats exploited by all sorts of native and introduced plants. The fields and pastures are haven for the St. John’s wort during summer - the source of our oils and tinctures.

2. FORMS OF WILDCRAFTING

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE 13 –14 August 1999.

2.1. Naturalised herbs

Exotic plants that were brought into Australia deliberately or by accident, and have managed to establish themselves to the point they are mostly regarded as “weeds”. Some of our most common weeds fit into this category eg. dandelion, nettle, chickweed, fleabane and yellow dock. Some of these weeds have established themselves so successfully they are categorised as “noxious weeds” – the most notorious being St. John’s wort.

By definition therefore these naturalised herbs are usually abundant and there is little risk to their survival. In the case of noxious weeds the main risk is the potential for spreading them by distributing their seeds into other sites where they may become established and cause serious problems for farmers and land managers.

Although we are unlikely to eliminate any exotic weeds through wildcrafting, we must still avoid harvesting whole sites. It is in our own interests to leave a proportion of the crop behind for future harvesting expeditions by ourselves or others, and also to leave sufficient mature plants for seeding and continuation of the local population of the species.

2.2. Native herbs

Harvesting native herbs is a far more sensitive issue. There are relatively few large commercial enterprises based on harvesting native herbs currently, but there is no guarantee this situation will not change. At Sunflower Herbals we harvest a handful of native species only – the main ones:

Eucalyptus melliodora

Dodonaea viscosa

Backhousia myrtifolia

Geijera parviflora (cultivated around farm homesteads)

Rubus parvifolius (may be introduced species?)

Melia azedarach ssp. australasica (may be cultivated or naturalised)

Urtica incisa

Tasmannia lanceolata (Mainly purchased off farm)

2.3. Importing wildcrafted herbs

For many people, particularly practitioners, wholesalers and consumers, their main experience of wildcrafted herbs is with the imported variety. We have already been told of numerous examples of endangered herb species being imported into this country having been harvested from wild stock. While the emphasis so far has been on North American herbs, we also import wild harvested herbs from Africa (eg. devil’s claw, pygeum (*Prunus africana*), Europe and Asia (allspice). In Europe it is estimated over half the medicinal herbs in commerce are from wild plants while in certain countries such as Spain, Bulgaria and Albania wild stock comprises most of the medicinal plant trade. Some well-known European herbs are considered threatened from over collection - these include liquorice, Arnica, bearberry, sundew, gentian, butcher’s broom, cowslip and

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE 13 –14 August 1999.

thyme [Lange 1998]. Companies and individuals trading in imported herbs should try to ensure these species are obtained from cultivated sources.

2.4. Biodiversity prospecting

Biodiversity bioprospecting is defined as the exploration of biodiversity for genetic biochemical resources of commercial value [Laird]. Usually these plants or other organisms are collected in areas of rich biodiversity but poor financial status – the samples are then sent for screening and evaluation in laboratories far across the ocean. This may be a fair deal for all concerned if approached in the right manner. For guidelines see Sarah Laird's paper -People and Plants online.

3. REGULATION and CERTIFICATION

3.1. Regulations

Convention on Biological Diversity

CITES

TGA

Harvesting licence – on crown lands eg. State Forests

Endangered Species Protection Act 1992 (Federal)

Threatened Species Conservation Act 1995 (NSW)

NPWS Flora Harvesting & Propagation Management Plan 1999-2004 – 3rd draft

Schedule 13 NPSW Act 1974 - “protected species”

The draft plan proposes another 32 “bush tucker” species be protected – some are also used for medicinal purposes eg. *Tasmannia spp.*, *Backhousia spp.* Harvesters, propagators and cultivators of any protected species would be required to hold licences and maintain an audit and tagging system on all produce harvested from these species. I agree with the need to regulate wildharvesting of these species but it should not apply to propagators and cultivators – these people are after all helping reduce the harvesting pressure on wild plants and they should be encouraged.

The NHAA responded to proposed plan – the following recommendations were made:

- management plan be redrafted to take into account the existence of the native herb industry as a stakeholder.
- The licencing system be simplified in order that growers and propagators not be subjected to the need for multiple licences
- The costs and record keeping requirements be minimised so as not to discourage “home grown” industries
- Assistance be given to relevant institutions and individuals to learn the techniques for acquiring population, distribution and abundance data of native medicinal plant species.

I have just been advised the current proposal will not proceed. According to a department spokesman Mr. Jeff Hardy there will not be a single all-encompassing plan, but there may be a series of plans for the various aspects of the flora industries. He assured me such plans will certainly not proceed in the short term or without considerably more consultation.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE
13 –14 August 1999.

3.2. Legislation in Montana and North Dakota

Recently a law was passed in Montana that placed a three-year moratorium on state lands for harvesting seven native plants, including *Echinacea angustifolia*. The fine for collecting any of the seven species is \$1,000 per day. In North Dakota anyone caught harvesting any species of *Echinacea* without permission of landowner or state lands may be fined up to \$10,000 and have their vehicle confiscated.

3.3. Certification systems – a way forward?

Two examples that may act as models:

Forest Stewardship Council. WWF's *Forest for Life* campaign – example of timber certification system. I believe that it is helped bring an end to native forest logging in New Zealand. A similar auditing system may be an effective control measure for wildcrafted produce.

The Rocky Mountain Herbal Coalition has compiled a Direct-Marketing Registry of ethical wildcrafters and organic growers of medicinal herbs, to act as a guide for buying herbs from ecologically conscious harvesters and growers. The current edition lists 12 such businesses, along with their bio-regional and range description, individual philosophy, nature of the business, representative herbs by common and botanical name, maximum harvest and price. The Registry contains other useful information such as wildcrafting guidelines and ethics, criteria sheet, and applications for listings. Anyone intending to wildcraft on a commercial basis should obtain a copy of the registry – the cost is U.S.\$10 (+postage) and contact details can be found on the hand out sheet.

One possible criticism– it could appear to be a little misdirected to be promoting the sale of wildcrafted species that are endangered or threatened – examples from the Registry include golden seal, black cohosh and *Echinacea angustifolia*. Then again these plants may be locally abundant and through good management their population numbers are not diminishing despite being subject to commercial harvesting.

3. 4. Organic certification

National Standards for Organic & Biodynamic produce, section C 3.16 permits the labeling of produce as 'wild-harvest' organic providing the following criteria are met:

1. Plants are harvested from a clearly defined collection area subject to inspection
2. Have received no unauthorised sprays or fertilisers (according to the Standards) for a period of 3 years before the collection
3. Collection does not disturb the stability of the natural habitat or the maintenance of the species in the collection area.

3.5. Guidelines, protocols

Wildcrafters Information Sheet – see handout

If such a sheet is adopted, it should be kept simple, despite the need for detail.

A signed Statutory Declaration may be appropriate.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE
13 –14 August 1999.

3.6. Rare, threatened and endangered plants

Lists of endangered plants are available through state and federal sources and can be accessed through the Internet. These lists will be discussed more fully in my presentation on native herbs tomorrow. In general avoid unusual plants such as orchards, sundews, ferns and parasitic plants other than mistletoes.

4. PHILOSOPHY AND PRACTICE

4.1. Philosophy

We need to gain a respect for the plants as individual organisms like ourselves – not treat them purely as objects to be exploited.
Communicate and pay respect to nature while harvesting.
Tread lightly and handle the plants gently.

“Wildcrafting is stewardship” – Howie Brounstein, the wildcrafters’ Godfather

4.2. Quality

Are ‘wild’ herbs more potent than cultivated herbs? There is no evidence for this claim. In fact there are so many variables here that it is impossible to apply standard rules. Many herbalists purchase wildcrafted herbs in favour of cultivated herbs, even paying more for them. This is a misguided practice and one that encourages the depletion of wild plant populations.

4.3. Scale of operation

It is tempting to ‘think big’ in terms of crop size – particularly when export contracts are around. Beware of the danger of going in too big. You need to be assured you are equipped to manage the amount of herb you have harvested. This may involve sifting out the weeds (eg. machine harvesting of St. John’s wort), having sufficient drying capacity or sufficient time and equipment to process the herbs into tinctures, oils or other value added products while herbs are still fresh – not to mention marketing the finished product.

Wildcrafting should be an enjoyable pass-time, an opportunity to be a part of nature and observe the plants, animals and ecology of places you would otherwise not have the opportunity to be in. It can also be regarded as an occasion for reflection, meditation and/or communication with fellow harvesters.

Better, I say, to have a network of wildcrafters working co-operatively than one or two big operators dominating the market. Resources such as harvesting machinery and drying facilities can be shared within communities or co-operatives. There is great potential for establishment of regional networks for wildcrafting herbs specific to their bio-regions. This system has the advantage of local knowledge, year-round monitoring of plant populations, interaction with landowners and authorities who manage public lands, reduced transports costs and associated pollution, sharing of resources and strengthening of social and economic ties in rural communities.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE 13 –14 August 1999.

While the lure of export dollars in exchange for access to plant materials for use in pharmaceuticals can be an attractive proposition, experiences in many countries has shown that meeting the demands of Pharmaceutical Companies can be fraught with problems. These include market fluctuations, shifting markets and changing regulatory climates – along with the perennial droughts, floods and other natural disasters. The history of certain high-profile plant medicines such as ipecac [*Cephaelis ipecacuanha*] and Peruvian bark [*Cinchona spp.*] reveals the level of difficulty in managing wild harvesting on such a large scale [Sheldon, Balick and Laird 1997]. These lessons need to be learned, so as not to be repeated in Australia.

4.4. Time management

Both time of day and seasonal time must be considered. For example aromatic herbs should be harvested in the morning, since the volatile components dissipate in the heat of the day. In St. John's wort, levels of one of the active compounds hypericin have been shown to drop dramatically after mid-day – supporting the traditional practice of harvesting the herb in the morning. On the other hand roots may be collected late in the afternoon.

Work to a calendar, ensuring you harvest in the right season. Allow for weather fluctuations - be flexible. Don't try to harvest during extreme weather conditions.

Examples of harvesting schedule

Sep-Oct – Hawthorne flowers & leaves, mullein leaves
Oct-Jan – St. John's wort, vervain, mullein flowers, milk thistle
Feb-April – Golden rod, yellow dock, poke root, rosehips
April-June – Hawthorn berries
July-Sep – Nettles, shepherds purse, clivers, chickweed
All year – Hop bush, Eucalyptus, myrtle leaves

4.5. Botanical awareness

All wildcrafters need a basic knowledge of plant identification and should become familiar with using floras and botanical keys. This is important so as to minimise the risk of poisoning the harvester or consumer. Harvesters need to be able to distinguish between plant species and in some cases even between sub-species and varieties.

Voucher specimens should be collected and prepared for all plant species likely to undergo commercial harvesting, as well as for other significant flora in the area.

4.6. Indigenous community involvement

Aboriginal elders, traditional inhabitants, healers, land managers – should be consulted and included in wildcrafting activities wherever possible. These people have a wealth of knowledge they may be willing to share with us if we approach them in the right way.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE 13 -14 August 1999.

Aboriginal communities should also be encouraged and assisted to establish their own wildcrafting enterprises, in conjunction with some 'bush food' enterprises I believe are already established in some north coast regions.

4.6. Harvesting methods

For the majority of wildcrafted species in Australia the aerial parts – leaves, flowers, fruits – are the main parts harvested from the plant. For annuals between 50 and 100% of the aerial parts can be harvested, while for perennials, shrubs and trees only 20-50% of the foliage should be harvested at one time. Once harvested, the aerial parts should be stored in the shade and transferred to a drying or processing facility at the earliest opportunity.

Barks and roots are more difficult since incorrect harvesting can bring on the plants' demise. Bark should be cut longitudinally – never cut transversely as this cuts off the plants water and food supply. If possible cut strips from branches rather than the main trunk, and select a number of trees rather than a single specimen. Remember it is the inner bark – the layer found beneath the fibrous outer bark - that is required for most species.

Root harvesting is a destructive process both to the plant itself and to the ground and adjacent plant species. Whenever possible dig roots after the plants have flowered and seeded allowing for regeneration. It may be possible to leave part of the plant or rhizome in the ground as a further means of regeneration and survival. Seed from surrounding plants may also be placed in the hole left following a root harvest, while it may be necessary to manually fill back the holes to minimise impact on the local ecology. Root harvesting should always be performed using hand tools. There are horror stories out of the USA of high demand species such as *Hydrastis* and *Echinacea* being harvested with front-end loaders and the like, a practice likely to decimate a local plant population while creating environmental havoc.

Whenever possible replant the area you are harvesting by scattering seeds and planting replanting root crowns. This practice should obviously be avoided when harvesting noxious or invasive species.

Ensure the stand is the best one available before commencing harvesting. I learned this lesson the hard way, spending hours harvesting a second-rate crop only to find far better stands just a kilometre or 2 away. Don't pick near roadsides, high-tension electric wires, industrial sites or polluted areas in general. Harvesting weeds growing around agricultural crops should also be avoided unless you have some certainty there have been no chemical sprays used. Remember noxious plants such as St. John's wort or blackberry are routinely sprayed and these should not be harvested unless you know for certain they are clean.

Before leaving a stand look around and complete any clean-up work or hole filling.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE
13 –14 August 1999.

5. SUSTAINABILITY and ECOLOGY

5.1 Sustainability of harvesting practice

Little research available in Australia. We are initiating abundance and biomass surveys for this purpose at our Field Study site near Merriwa in the Hunter Valley. The species being initially targeted in this respect are *Dodonaea viscosa* and *Eucalyptus melliodora*.

Some research is published from the USA (Foster 1991) and India.

Murali and Srinivasulu of the Ytata Energy Research Institute in Bangalore assessed the effect of harvesting at different levels on the growth and reproduction of a number of medicinal plant species growing in a reserve. Harvest regimes ranged from no harvest, 25%, 50% and 100% of plants in standard size plots laid randomly, while observations on plant density and regeneration was monitored over two seasons. Most of the plants studied were affected by the harvest apart from two which were unaffected – *Hemidesmus indicus* and *Dioscorea bulbifera*. Other species showed varying levels of decreased regeneration from harvesting compared to the control plots, while two species – *Asparagus racemosus* and *Decalepis hamiltonii* regenerated poorly even at the lowest (25%) harvesting regime. The authors concluded the latter species should not be harvested from the wild while two species of *Sida* (*S. rhombifolia*, *S. cordifolia*) should be harvested at low intensities only.

Research of this kind is desperately needed on harvesting impact on our indigenous flora.

5.2. Land use and ecology

Factors to consider:

- history of land use
- respect for land ownership – owner's permission
- public land – may need permit (eg. State Forests)
- no harvesting permitted in national parks.
- impacts of harvesting on ecology – eg. erosion,
- disturbance of understory plants

5.3. Biodiversity

Weeds – play a role in ecology and shouldn't be regarded as 'the enemy'.

Preservation of remnant bushland – provide multiple benefits including havens for wild herbs.

6. RESEARCH and EDUCATION

6.1. Research

Research programs should contribute to conservation and development activities in the study area. Small pilot studies should be conducted before large commercial ventures are undertaken.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE 13 –14 August 1999.

There is a desperate need for surveys to be conducted to assess the impact of harvesting on our indigenous herbs.

6.2. Apprenticeships

An apprenticeship system is the ideal way to learning wildcrafting. I have taken on apprentices in wildcrafting practice, as well as for botanical surveys, native herb research and organic herb farming. Apprentices generally come out of participants at our regular medicinal herb field schools. Wildcrafting apprentices learn to correctly identify a selection of wild plants and locate their own stands for harvesting. They assist in seasonal collection of a number of species. Assessment involves presentation of a harvesting plan for at least one wild plant species, and of a finished product (tincture, oil etc.) manufactured from that species. Inquiries are welcome.

6.3. Cultivation of wild species

Along with conservation, cultivation is usually seen as the most obvious means of preserving genebanks on our native flora. Some excellent techniques for domesticating wild plant species are described in Given and Harris 1994 chapter 9. The native food industry is another appropriate model for the native herb industry since they have already investigated this issue and are accumulating a body of research data on specific plant species. In a paper titled "Native foods and provenance" Johnny McCarthy of Sydney Bushfood Nursery warns that introduction of superior or clonal genetic selections planted in areas where wild populations of the same species occur, could weaken the existing gene pool – ie. a form of genetic pollution. The risk can be minimised, he advises, by designing small scale, mixed species plantation or utilising wind breaks and shelter belts [McCarthy 1998].

For some species a system of semi-cultivation may be more appropriate. A herb known as 'devil's claw' (*Harpagophytum procumbens*) is imported into this country as an anti-inflammatory medicine for treatment of arthritis. The plant originates in the Kalahari Desert region of Southern Africa, and until recently roots of the herb were obtained solely from wild sources and harvested in an unsustainable way. While commercial cultivation of the plant is not considered feasible because of its peculiar ecological requirements, a research project in farming land of southern Namibia has demonstrated that sustainable harvest is possible using a combination of shifting cultivation and restoration methods. The traditional harvesting procedure for this plant involves digging up the rootstock, removing the secondary storage roots - the sought-after part of the plant – and discarding the remainder, leaving the excavated holes uncovered. Under the new method only a portion of the crop is harvested in each season, and the primary roots along with surrounding *Harpagophytum* fruits are buried in the excavated hole which is then filled in. Adoption of this technique has led to an increase in plant populations with no loss of genetic diversity despite large scale harvesting. Jobs have been retained and the ecological landscape remains more or less unaltered [Schneider 1997].

Shifting cultivation such as this has been widely employed for tropical food plants such as yams, and there is no doubt Aborigines manipulated their local ecosystems in similar ways – particularly with the use of fire.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE 13 -14 August 1999.

7. CONCLUSION

So as we have already learned today there are alternatives to unsustainable harvesting practices, while on the other hand there is an array of naturalised herbs for which sustainability is not a major issue.

Wildcrafting is an ancient practice, one that has enabled humans to form and maintain strong links with the plant world. Let us ensure that our role here is one of custodianship and not exploitation.

Thank you.

References

- Cech, R.A. 1998. Balancing conservation with utilisation. *Herbalgram* 45: 18, 58-60.
Foster, S. 1991. Harvesting medicinals in the wild. *Herbalgram* 24: 10-16.
Given, D.R. & Harris, W. 1994. *Techniques and Methods of Ethnobotany*. Lincoln University, New Zealand.
Klein, R. 1999. *Collecting Recommendations for Montana*. Sweetgrass School of Herbalism Montana.
Lange, D. 1998. *Species in Danger. Europe's Medicinal and Aromatic Plants*. TRAFFIC International, London.
McCarthy, J. 1998. Native foods and provenance. Conference on Provenance, Greening Australia.
Murali, K.S. & M. V. Srinivasulu. Undated. *Use of Medicinal Plants in A Sustainable Way - Assessment of Impact Due To Extraction*. Tata Energy Research Institute, Bangalore India.
National Parks and Wildlife Service. 1999. *Commercial Use of Protected & Threatened Native Plants in NSW*. 3rd Draft.
Organic Produce Advisory Committee 1998. *National Standard for Organic and Bio-Dynamic Produce*. AQUIS, Canberra.
Rocky Mountain Herbalist Coalition 1998. *Direct-Marketing Registry*. 12th edition
Sheldon, J.W. Balick, M.J. & Laird, S.A. 1997. *Medicinal Plants: Can Utilization and Conservation Coexist*. New York Botanical Gardens, New York.
Schneider, E. 1997. Sustainable use in semi-wild populations of *Harpagophytum procumbens* in Namibia. *Med. Plant Conservation* 4: 7-9.
World Wildlife Fund. 1996. *Forests for Life. Timber certification in Australia and New Zealand*. WWF Australia.

Organizations and web sites of interest

- Columbine and Wizardry. Howie Brounstein. www.teleport.com/~howieb/howie.html
Medicinal Plants Working Group. Julie Lyke. www.nps.gov/plants/
Native Herb Forum. Andrew Pengelly. www.nhaa.org/au/forum/index/html
People and Plants Online. www.rbgkew.org.uk?peopleplants/
United plant Savers. www.plantsavers.org/
Herb Society (UK) Conservation appendix
- [www.metalab.uncedu/herbmed/Herb Society/conservation.htm](http://www.metalab.uncedu/herbmed/Herb_Society/conservation.htm)
Tibetan Plateau Project. Discussion group on medicinal plant conservation and traditional Tibetan medicine. Justin Lowe. tpeia@earthisland.org

Certification of Organic Products in Australia

Liz Clay

Bioscape Pty.Ltd.

More and more people throughout the world are appreciating organic food. Consumption of organic food is increasing throughout the world at a rate of 15-30% per annum, - and Australia is no exception.

Why do people want organic food?

There are many reasons why organic agriculture is gaining so much popularity. In conventional agriculture the goal of maximum output is being countered by wide spread concerns over the environmental impacts. Further more there is a growing realization that the earth's finite resources need to be more carefully managed. Many supporters of the organic industry believe that the current trends in agriculture – high production, high efficiency, high input and now biotechnologies are not sustainable and indeed are at odds with nature.

The social impacts of the decline of rural communities as a result of the push for larger, more efficient and higher productivity farming systems are also reasons why many consumers throughout the world are making the conscious decision to support organic agriculture.

British economist Nicholas Lampkin (1990), observed the following questions and criticisms of current conventional agricultural practice:

That it damages the environment and soil structure, creates potential health hazards, has brought about the reduction of food quality, is energy intensive, involves intensive animal production systems that are ethically unacceptable, and that it is economically costly to society and increasingly so to the farmer.

These perceptions of modern food supply systems are held by a growing number of people who also believe that organic agriculture has a positive contribution to make in some of these areas.

In association with the perspective that organic farming represents a more environmentally friendly and natural way of farming, consumers believe that organically produced food is better for you too.

What is Organic Certification?

In Australia the production and manufacturing of organic products is regulated by the National Standard for Organic and Bio-Dynamic Produce. This commonly agreed to definition of organic agriculture and processing is the guideline for Australian certification agencies to develop their own more specific standards. The Australian Quarantine and Inspection Service (AQIS) supervises the seven Australian accredited certifying bodies' implementation of the standard.

Those organizations certified with AQIS are; The National Association for Sustainable Agriculture Australian (NASAA), The Biological Farmers of Australia (BFA), The Bio-Dynamic Research Institute (BDRI), The Organic Herb Growers of Australia (OHGA), The Organic Vingerons of Association of Australia (OVAA), The Organic Food Chain (OFC) and Eco Organics of Australia. In addition to AQIS accreditation, NASAA is one of the very few certifying agencies throughout the world that is also accredited with the International Federation of Organic Agricultural Movements (IFOAM). (Insert certification logos here. – see RIRDC Shaping the Future for Australian Organics issue # 3 July 1999 Page7)

The organic standards in Australia and throughout the world, do not make claims that organic farming produces better or cleaner food. They do however describe the method of agricultural production and outline the inputs that may be used in an organic farming system. Organic agriculture also requires that all possible preventative measures are in place to ensure that the farm is not exposed to prohibited chemical, physical or microbial contaminants. More recently the risk of genetic pollution from genetic engineering is also considered a potential source of contamination that must be avoided.

The standards define organic farming and the processing of organic products. They detail how both should be monitored by documentation and annual, objective, third party inspection. The intention of labelling of certified organic products is to send a clear message to consumers, - that when you buy organic products you are assured that you are not contributing to the contamination of the soils, the water, the air by synthetic agro-chemicals. Rather you are contributing to the sustainable use of the earth's natural resources. The growing numbers of consumers who believe in this ethic demand production assurance. It is no surprise that the organic standards are developed at the grassroots level by the consumers, farmers and others involved in the organic industry.

Certification of organic farming allows Australian producers and manufactures access to the lucrative international organic market place. Our major markets are Europe, Japan and North America where organic products fetch premium prices. All organic products exported from Australia must be accompanied by an Export Control Order. It is illegal to export without one. These certificates provide verification that the product is certified organic and are only issued by the AQIS accredited organic certification organizations.

What is the conversion period to organic?

Conversion of a farming system to organic requires a long term perspective. It therefore requires a plan to accommodate the impacts of the change of management practices regarding soil fertility, plant nutrition, animal health, and pest, disease and weed control. For this reason certifiers recognize a conversion period that may take some three years or more years to achieve.

The National Standard states that a farming enterprise must undergo a twelve month period of supervision by an accredited certifying agency to ensure a workable conversion plan is in place. The period of supervision occurs after the first inspection and prior to

entering **the organic in conversion** period when produce can be sold in the organic market place labelled accordingly

A property in **conversion** is defined in the National standard as "... a production system that has adhered to the standard for at least one year, and has been certified as such, but has not qualified as **organic** for reason such as; the conversion system has not been operated within the requirements for the specified period (usually three years); the farm does not meet quality standards, ie soil structure considered appropriate and necessary for organic farms; or the organic management plan has not been sufficiently developed."

What paper work is involved?

Certification is granted upon inspection by an approved inspector who reports to the certification body. Before the inspection the farmer must complete a farm conversion plan questionnaire provided by the certification body. Information required includes a background to the operation, the management plan, maps detailing production areas, irrigation system, storage facilities, and surrounding land use. The dates of application of the last prohibited inputs are also required. The farmer is expected to work closely with the inspection body and must complete legal documents that pledge to abide by the regulations of the organization.

Certified farmers are licensed to use the certification agency's organic label on their produce. To ensure their production methods are in compliance to the standard, certified farmers are subject to an annual inspection by the certification agency. The inspection includes a review of the farmer's performance and ability to comply with the standard. Records must be kept of all inputs used on the farm and all outputs including sales, wastage and any produce that might be withheld from sale such as for seed and feed. Dates, volumes, destination, unit description, application rates, must be recorded. Farmers are expected to keep a diary of day to day farming activities and must report any changes to the site or to the nature of the enterprise.

Farms may be converted to organic gradually. If the farm is only partially certified meticulous records must be maintained of both the organic and conventional enterprises. Farming of the same variety of species on a farm that is partially certified is called parallel production and is not allowed because of the opportunity for mixing.

The National Standard now requires every organic farmer to have in place a quality management program that is compatible with HACCP principles. A range of industry sectors have already developed quality management programs for their industries and organic farmers are encouraged to tap into these systems.

What is HACCP?

Hazard Analysis and Critical Control Points (HACCP) is an internationally recognized basic tool used to develop food safety and quality management systems. The main focus of a HACCP food safety program is to put in place measures that prevent

microbiological, chemical or physical contamination, rather waiting for the hazard to occur before taking action to correct it.

The process of HACCP is to analyse every part of the businesses' production, harvest, and handling to identify the major hazards with respect to food safety and quality. The identified hazards are then monitored and preventative measures are put in place to prevent the hazards from occurring.

Some important food safety hazards to consider on an organic farm might include: the manufacturing of compost, water quality for processing or washing produce, pest control, contamination from outside sources and clean down procedures.

Why is record keeping so important?

The National Standard for Organic and Bio-dynamic Produce describes the definition for organic production in Australia with a guarantee to the consumer that these production methods are monitored. The inspection body relies on the accuracy of records maintained by the farmer as the essential elements for providing credibility and transparency. Insufficient record keeping is not only an infringement of the standards, but effectively prevents an inspection from being carried out. If an organic farmer does not keep proper records, a warning is usually given. If this is not corrected certification will be withdrawn.

What is the cost of Organic Certification?

The seven AQIS accreditation agencies are audited by AQIS to ensure they are maintaining the required level of supervision over their licensees. In turn AQIS themselves may be monitored by other organisation such as the European Union. These levels of scrutiny come at a cost.

The certification agencies operate as a not for profit organizations with a range of structures from co-operatives to private companies. Each has a different fee and membership structure which may change from time to time. Some agencies offer certification for a wide range of products such as NASAA, BFA and OFC, while others are industry sector specific such as OVAA, OHGA and Eco Organics. The BDRI only certify Bio-dynamic production systems. Growers are advised to shop around to ensure that the certification agency of their choice provides the service they are looking for not only for now but for in the future.

Most agencies charge an initial joining fee that may include membership to the organization, inspection costs, soil and tissue testing, administration and review fees. New growers, depending on their size of operation could expect to pay around \$500.00 to join. Each year thereafter, annual inspection, administration, and membership costs are required. Some certification bodies charge a levy based on the percentage of product sold into the organic market place, others a flat fee with inspection costs billed separately. Once again potential organic farmers should shop around to find the agency that best suits their situation.

References:

OPEC, 1998. National Standard for Organic and Bio-Dynamic Produce. Second Edition. AQIS. Canberra.

Lampkin, N. 1990. Organic Farming. Farming Press. U.K.

IFOAM 1998. Basic Standards for Organic Production and Processing.

Liz Clay

Powelltown Road
Noojee, 3833
Victoria, Australia

Phone & Fax -
(03) 5628 9557
International -
+61 3 5628 9557

Mobile -
0417 393 363

Email -
liz-clay@sympac.com.au

Accreditation
& Certification

Ecological
Production
Systems

Education &
Training

Some Common Questions and Answers to Issues Regarding Organic Certification

Does the certification labelling of organic food simply mean that organic food is "good for you"?

More and more consumers in Australia and overseas are appreciating organic food. Consumption of organic food is increasing through out the world by between 15 – 25% per year, more in some countries.

In Australia the production of organic and marketing of organic food is regulated by the Australia National Standards for Organic and Bio-Dynamic produce. The Australia Quarantine Inspection Service (AQIS), is the body that supervises the industries' implementation of the Standards. The Standards do not claim that organic produce is better or cleaner from an analytical standpoint. It does however describe the method of farming and outlines the inputs that may be used in an organic system. The description contains traditional and mostly natural plant protection agents and fertilizers. Consequently the description of organic farming as described in the standards, prohibits the use of organo-synthetic pesticides and herbicides and synthetic fertilizers. Processing can only take place with the use of non-organic substances as listed in the Standards.

The Standards define organic farming and the processing of organic products. It details how both should be monitored by documentation and objective third party inspection. Therefore the message is clear to consumers – if you buy certified organic food, you do not contribute to the contamination of the soils, the air, the water by drift or leakage of synthetic agro-chemicals. You contribute to the sustainable use of natural resources by buying organic food.

There is a great deal of research that has been conducted by various organizations that does demonstrate the superior nutritional value and safety of organically produced food but this is not implied in the Standards.

It should also be noted that a great many environmental and cultural factors influence the nutritional composition of produce, and these may ultimately play a greater role in food quality than simple organic versus conventional logic. Soil type, soil moisture and soil health (humus content fertility, microbial activity) are examples of such factors.

(For further reading find attached -
Hornick, S. B. 1992. Factors affecting the nutritional quality of crops.
Am. J. Alternative Agriculture. Vol.7 (1-2) :63-38.)



Is Organic Food Guaranteed Pesticide Free?

Organic food is produced without the use of synthetic fertilizers or agrochemicals. The use of these highly potent substances is prohibited in organic farming. Organic farmers may only use those farm inputs that are described in the "Allowed Inputs" list in the Standards.

Although grown in this manner, organic crops can be exposed to unavoidable, unknown environmental pollutants such as ground water, air pollutants, and possibly drift from chemicals used on other properties. The risk of genetic pollution from genetically modified organisms presents as another potentially contaminant.

In Australia some certification agencies test the soil for residual organochlorines and organophosphates, and have determined an acceptable maximum residue levels (MRL) below that set by the Australian and New Zealand Food Authority. Both groups of chemicals are persistent and are known to be harmful to the environment and animals including humans. This testing provides a benchmark for the pesticide status of the soil and consequent management decisions.

In such soils restrictions are placed on the organic production, i.e. root crops may not be grown, protocols for the harvesting of leaf and seed crops must be put in place to ensure no contamination with the affected soil. Further tissues testing will determine the level of uptake of the pesticide in the plant and ongoing batch tissue testing may be required. In any event certifying organization must conduct random testing of produce based on 5% of farms for pesticide and heavy metal residues

If the inspection body does detect chemical residues in produce it will take into account the possible causes of these traces, the status of the product and the action to be taken. The certification process cannot guarantee that food produced organically will not contain pesticide. It does however ensure that all possible actions are taken to avoid chemical contamination and maintain the safety of organic food products.

What is the period of conversion to organic?

Farming organically requires a long term perspective. There are no quick fixes that an organic farmer can resort to if things go wrong during production. Organic conversion requires a plan for the management of a farm as a *system*. The plan should include the establishment of records and an audit trail to prove the chain of custody of the produce. The management plan should include a balanced crop rotation, measures to enhance soil fertility, the use of legumes to fix nitrogen into the soil, and the use of green manures and deep rooting plants.

In addition the plan must include preventative methods for pests, disease and weed management. Land care issues such as erosion controls, revegetation, establishment of buffer zones and protection of remnant vegetation may also require consideration.

Given this list and range of activities the Australian standards have deemed that a twelve month period of supervision by a certification body is necessary to ensure that this plan is

organic for reasons such as:

- the organic management plan is not yet sufficiently developed,
- the farm does not meet the quality standards,
- or that the conversion system (usually 3 years), has not been operated for the required length of time.

How much paperwork must be completed by certified organic farmers?

Certified organic farmers must submit to an annual, objective, third party farm inspection. Certification is granted upon inspection by a knowledgeable, objective, expert who reports to the certification body. In preparation for an inspection a farmer must complete a questionnaire provided by the certification body, that seeks a background to the operation and describes all the practical measures that will be taken. This information must include a farm map detailing production areas, storage facilities, drainage lines, surrounding land use, slope and aspect. The dates of the last application of prohibited inputs must be listed. The farmer is expected to work closely with the certification agency and complete legal documents that pledge to abide by the regulations of the organization.

What ongoing records must an organic farmer complete?

Each year the organic farm plan is updated by the annual production and management schedule which is returned to the responsible inspection agency. Records must be kept of all inputs imported to the farm. Details of which include dates, volumes, name, source and application rates. All produce sold must be recorded. Dates, volumes, destination, unit description and product name must be recorded. Farmers must report any changes to the site and to the nature of their enterprise. If the farmer's management plan includes gradual conversion of the farm paddock by paddock, separate records must be carefully maintained for the conventional, in conversion and organic areas.

The Australia and New Zealand Food Authority (ANZFA), have required that farming enterprises in the future should have a HACCP (Hazard Analysis, Critical Control Points), based farm plan for food safety. Accordingly, this has now become a requirement of the National Organic and Bio-dynamic Standards. Essentially this means adopting measures that will ensure food safety based on a food safety plan that embodies HACCP principles.

What is HACCP?

HACCP, is a process that

- analyzes potential microbiological, physical and chemical hazards in the production, harvesting, packing, storage, preparation, manufacturing and transportation of food

- Enables decisions to be made about how critical those points are in terms of food safety.
- Identifies and implements effective control and monitoring procedures at the critical points.
- Undertakes to review the analysis, critical points and controls whenever changes are made to the operation.

Records are required to be maintained to verify that monitoring and actions have been under taken to ensure the safety of food. These records are open to scrutiny at the time of inspection.

Is the farm's organic status at risk by insufficient record keeping?

The Australian National Standards for Organic and Bio-dynamic Production has set rules for organic production. It does not define measurable food qualities for the final product. It does however guarantee to the consumer that the production methods are monitored. The inspection bodies rely on accurate farm records as the essential elements for providing credibility and transparency. Insufficient record keeping is not only an infringement of the standards, but effectively prevents an inspection from being carried out. If an organic farmer does not keep proper records, a warning is usually given. If this is not corrected, certification will be withdrawn.

When may an organic label be used on a manufactured product?

The use of an organic certification label can only be used on products that clearly relate to a method of agricultural production produced in accordance to the requirements of the Australian Standard. Organic labels are issued to farmers and manufactures under license by an approved certification body and must therefore be subject to annual inspection by the same.

Only those substances listed in the Australian Standards may be used as ingredients of non-agricultural origin in manufacturing. These include approved food additives, processing aids and carriers. Organically derived ingredients must be used if available, however non-certified ingredients may be used in the preparation of certain products if certified organic ingredients cannot be sourced. However these non-certified products must not exceed 5% of the content of the ingredients of agricultural origin in the final product.

References

AQIS, 1998. Australian National Standard for Organic and Bio-dynamic Produce. 1998.

Schmidt H. and Haccius M. 1998. EU Regulation "Organic Farming". Margraf Verlag. Germany.

IFOAM - Standards for Organic Agriculture.

Stakeholders in the Herbal Renaissance in Australia

-Michael Schubert

Preamble

First, I'd like to acknowledge the Bundjalung Nation, on whose land this conference is being held. And I'd like to remind us of where we, the industrialised nations, were in the 1940s, when Aldo Leopold was one of a few lone voices discussing ethics and sustainability:

"There is as yet no ethic dealing with man's relation to land and to the animals and plants which grow upon it. Land, like Odysseus' slave-girls, is still property. The land-relation is still strictly economic, entailing privileges but not obligations." Aldo Leopold, *A Sand County Almanac*, 1949 (1)

Introduction - Traditional and Complementary Medicine in Australia

Western industrialised nations are experiencing a renewed interest in the use of traditional and complementary medicines, the majority of which utilise plants as source materials. This renewed interest has come to be known as the "herbal renaissance", and has been attributed to a number of factors, including a public dissatisfaction with the western medical paradigm for solving health problems. Australia is no stranger to this renaissance. Whilst the indigenous peoples of our nation have continued their traditional medical practices for over 100,000 years, each wave of settlement and immigration has brought to our shores the healing traditions of the country of origin of the settlers.

British colonisation in 1788 brought the western herbal tradition. Within one year of settlement an apothecary's garden was established to serve Australia's first hospital (2). The gold-rush era of the nineteenth century attracted Chinese migrants, and 50 Chinese herbal medicine practitioners were estimated to be in the Victorian goldfields by 1887(3). The popularity of homoeopathy in Britain during the 19th century was similarly experienced in Australia, resulting in the establishment of the Glebe Homoeopathic Hospital in Sydney and Prince Henry's Hospital in Melbourne.

Osteopathy and chiropractic, as well as Indian (particularly Ayurveda), Oriental and Pacific healing traditions have continued to develop throughout this century. This range of modalities is supplemented by many cultural groups within the Australian population, who continue their medical and healing traditions within their own communities.

Utilisation of Traditional and Complementary Medicine - Facts and Figures

In the last decade utilisation surveys have indicated that Australia has one of the highest rates of utilisation of plant medicines *per capita*. Current utilisation of "alternative medicines" is in the order of 48.5 % in South Australia (SA)(4) and 65% in the northern region of New South Wales (NSW)(5). Compared to a 1990 US survey that indicated a 34% utilisation by the US community (6), these figures suggest a greater utilisation by the Australian population. Table 1 summarises the data.

Year	Location	Respondents	Response	Utilisation
1990	US	1,539	67%	34%
1993	Aust(SA)	3,004	73%	48.5%
1995	Aust(NSW)	645	44%	65%

Table 1: Utilisation of Alternative Medicines in Australia and the US.

The NSW survey recorded 1,197 instances of natural product utilisation and the preparation used in each instance. Sixty-five percent of respondents were currently using at least one natural product. The type of products used were classified as nutritional (57%), plant medicine (33%), homocopathic (8%) and other products (2%). Diagram 1 illustrates these findings.

Alternative Medicines Used in Northern NSW 1995

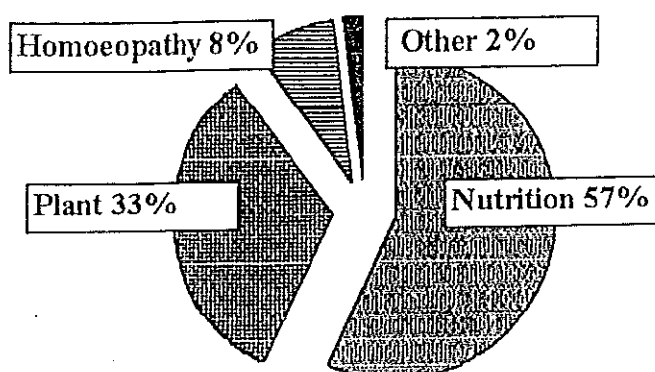


Diagram 1: Alternative Medicines Used in Northern NSW, 1995

The SA survey limited its sampling of utilisation of natural products to a choice of 11 product categories. When the SA data is analysed according to the type of product and compared to the NSW data, there is a similar pattern of utilisation for nutritional products, plant medicines and homoeopathic products.

The NSW survey showed that self-prescription was the main method of treatment with alternative medicines (71%). The Australian public has ready access to products in health food stores, although certain products are available only to practitioners (designated by the Therapeutic Goods Act, 1989), who act as their own dispensers. Respondents reported practitioners prescribing natural products as naturopaths and herbalists (46%) and homoeopaths (14%), Traditional Chinese Medicine (TCM) (5%) and chiropractors (3%). For those who chose to use a practitioner (29%), naturopaths and herbalists accounted for 39% of consultations, counselling and psychology 25%, osteopathy and chiropractic 16%, TCM 13%, massage therapy 10%, and homoeopathy 7% (5).

Summarising all of this means that: 2 out of 3 Australians use alternative medicine; and 1 out of 3 of those people use plant medicines; which means that 2 out of 9 Australians use plant medicines. With a population of over 18 million people, allowing for children, this means that at least 2 to 3 million people are utilising plant medicines.

What's a Stakeholder?

Identifying "stakeholders" has become a popular and "politically correct" practice. Stakeholders, by most definitions, are those who perceive that they have an "interest" in the issue under examination. Stakeholder identification usually precedes a negotiated outcome, as the various

stakeholders, by definition may have different, often opposing, points of view.

In the context of this conference "Medicinal Plants for the Future - Sustainability and Ethical Issues", we have hopefully attracted a range of stakeholder representatives. This conference is a natural progression at a national level from the international Bangalore Conference in 1998, "Medicinal Plants for Survival", which attracted over 400 delegates from around the world. To my knowledge, Australia is the first country to have followed on from the Bangalore conference.

So who are the stakeholders?

Perhaps it is best to start with the plant, taking a "bottom up" approach to medicinal plants, from the soil, to see where they end up, and what happens along the way. I can imagine various artificial and theoretical "pathways" of production. Using this model may assist in determining the stakeholders. Diagram 2 illustrates a very simple view of the route a plant takes from the soil to the marketplace.

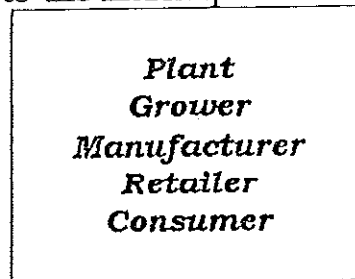


Diagram 2: Stakeholder Pathway - Primary Stakeholders

This is naturally too simplistic, but quickly identifies a number of stakeholders. Practitioners, regulators, educators and researchers will be feeling a bit left out, so I'll complicate it a little, keeping the original pathway in italics (Diagram 3).

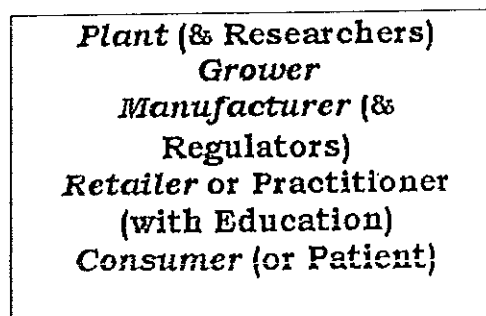


Diagram 3 : Stakeholder Pathway with Ancillary Stakeholders

Again, the diagram is simplistic and theoretical, but you can probably see where this is leading. Depending on how you view it, every function ancillary to the primary stakeholders also has an investment in the

process, and is thereby a stakeholder. For each group, there are personnel and other industries. If this seems a little extreme, just a few hours away from this conference is a herbal manufacturing company, that within a few years of its establishment, became the town's biggest employer, with over 100 employees in an area of high unemployment.

It really depends on how you perceive the issue that determines the legitimacy of stakeholders. The trouble with the stakeholders so far identified, is that the issues of "ethics and sustainability", the themes of our conference, haven't been identified. I'll include some of them, using capital letters to identify the new stakeholders (Diagram 4).

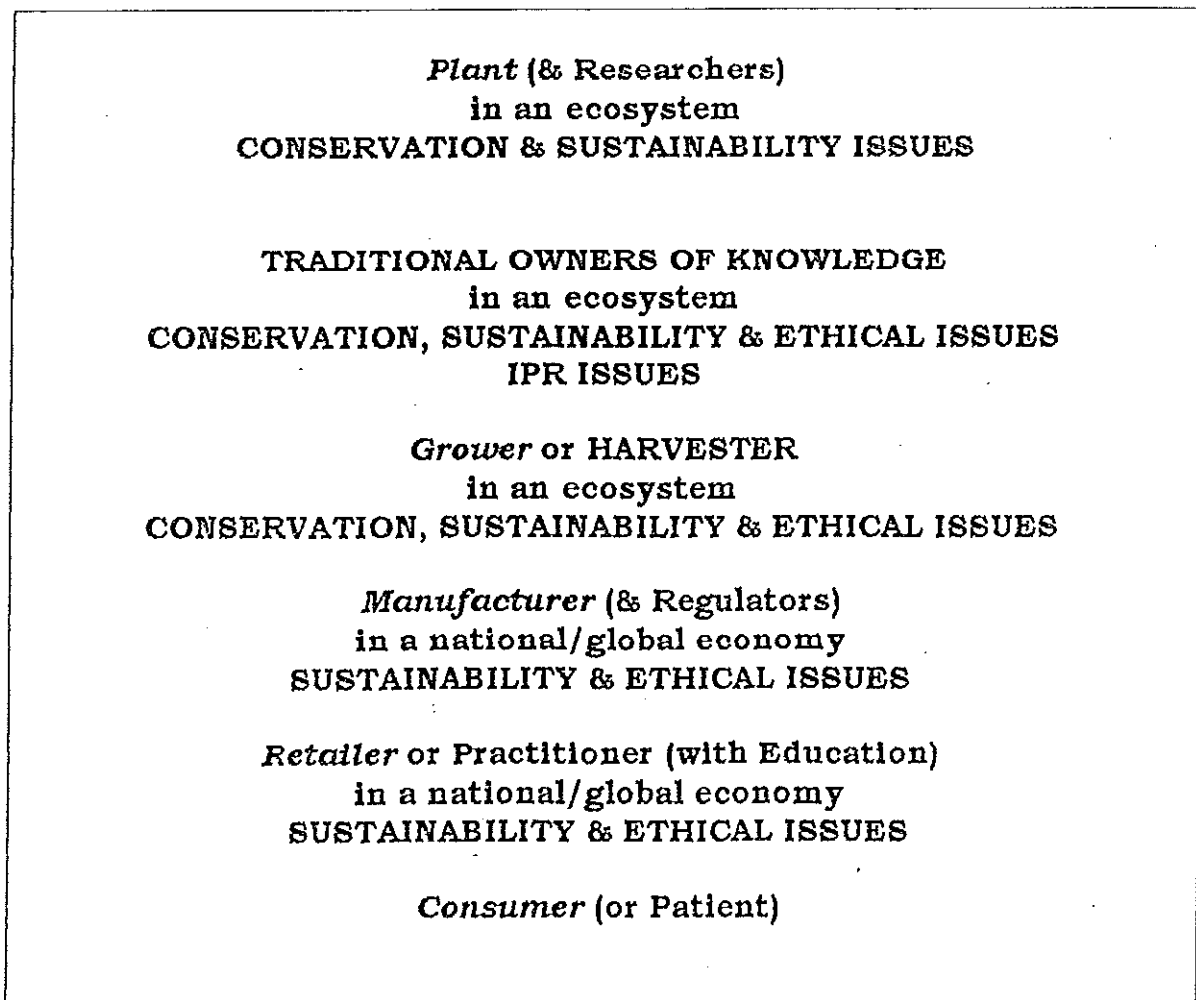


Diagram 4: Stakeholder Pathway with Ethics and Sustainability

Whilst this model is not particularly elegant, nor is it necessarily correct, it does create a useful discussion forum. Protagonists of IPR, conservation issues, ethical issues and sustainability issues appear as stakeholders claiming legitimacy. The questions might well be asked: Who are these people, and do they have a legitimate claim to be involved in the process?

In the main they are local, national and international NGOs (Non-Government Organisations) and researchers. Conferences like this provide the platform for their various agendas to be discussed. There is one important critique. If conferences are the only mechanism for some of these stakeholders to have a voice, then we will never hear from them. Power, money and status will triumph and at the end of the day, the status of the conference outcomes will only be as strong as the influence of those who carry the torch forward.

In Bangalore, a marvellous series of discussions and plenary sessions took place, resulting in a number of declarations. Bangalore was seen as the natural outgrowth of the Biodiversity Convention and the conference at Chang Mai (Thailand). Here in Australia, as elsewhere, we are greatly separated from the origins of our plants, their natural environments, and the custodians of the knowledge surrounding the plants.

We cannot appreciate, for instance, the fate of the poorer local people in southern India, who in one region I visited in 1998, could no longer afford *Withania* for their families, because the wild populations have been harvested and sold to the US and Australia. Even local (Indian) manufacturers of Ayurvedic products have seen the price quintuple in a span of three years due to the larger export prices gained.

These are complex issues, and I wish us well in finding our way through the next few years, as we continue to exploit the one stakeholder I haven't mentioned - the plant. To support the plant, we need to develop a deep ecological sense of stewardship. And to finish, as I started, with one of the early subversives, as he was considered in the 1940s, the ecologist Aldo Leopold:

"All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in the community, but his ethics prompt him also to co-operate (perhaps in order that there may be a place to compete for)." Aldo Leopold, *A Sand County Almanac*, 1949 (7)

References

1. Leopold, A, A Sand County Almanac, Oxford University Press, London, 1970 (reprint of 1949 edition), p 203.
2. Kirby, R., A Herbal Heritage, Robyn Kirby, Sydney, 1990.
3. Loh, M., 'Victoria as a catalyst for western and Chinese medicines', Journal of the Royal Historical Society of Victoria, 1985, pp. 39-46.
4. MacLennan, A.H., Wilson, D.H. and Taylor, A.W., 'Prevalence and cost of alternative medicine in Australia', Lancet, 1996, Vol. 347, pp 569-573.
5. Kermode, S., Myers, S.P., Ramsay, L. and Evans, S., 'Natural and complementary medicine on the north coast of N.S.W.', unpublished.
6. Eisenberg, D.M., Kessler, R.C., Foster, C., Norlock, F.E., Calkins, D.R. and Delbanco, T.L., 'Unconventional medicine in the United States', New England Journal of Medicine, 1993, Vol. 328, No. 4, pp. 246-252.
7. Leopold, A, A Sand County Almanac, Oxford University Press, London, 1970 (reprint of 1949 edition), pp. 203-204

A COMPARISON OF AMERICAN GINSENG AND GOLDENSEAL MANAGEMENT STRATEGIES IN THE USA

Chris Robbins
TRAFFIC North America

Eastern United States forests (Appalachian Mountains) are home to a wide variety of native herbs, shrubs and trees that are found in U.S. commerce.

Between 3100 and 3400 species of vascular plants inhabit the forests of Appalachia.

Appalachia is one of more than 200 global eco regions identified by WWF US for their biological bounty.

Two such species from this region received notoriety:

American ginseng (*Panax quinquefolius*)
Goldenseal (*Hydrastis canadensis*)

Companion plants found in the understory of damp hardwood forests of Eastern US and Southern Canada.

Other medicinal plants associated with ginseng and goldenseal include:

Black cohosh (*Cimicifuga racemosa*)
Yellow lady's slipper (*Cypripedium calceolus*)
Mayapple (*Podophyllum hexandrum*)

Both species are under pressure from:

- ◆ Habitat alteration
 - timber / mining operations
 - residential / commercial sprawl
- ◆ Competition from alien plants
- ◆ Predation – white-tailed deer
- ◆ Climate change – less precipitation
- ◆ Harvest for commercial trade
- ◆ Out of concern for species due to commercial trade

CITES Appendix II:

- ginseng first receiving protection under the Convention in 1975;
- Goldenseal being listed in June 1997.

The US Government has to make two findings with respect to satisfying CITES requirements and before approving export:

NO DETRIMENT

1. Ensure that export of specimens from the US will not be detrimental to species survival.

LEGAL ACQUISITION

2. Must be reasonably assured that the specimens intended for export were legally acquired.

RESPONSIBILITY OF USFWS

So primary purpose of CITES listings for ginseng and goldenseal is to ensure that exports of their roots are sustainable and legal.

US government established domestic mechanisms under which harvest and trade can be quantified, monitored and evaluated.

Each approach is markedly different and offers unique experiences from which valuable lessons can be learned and applied to the development and implementation of other monitoring programs.

Each approach has strengths and shortcomings – can be used to improve the implementation of CITES listings for medicinal plants in the United States.

AMERICAN GINSENG – MOST COVETED MEDICINAL PLANT

- ◆ Bulk of trade to Hong Kong
- ◆ Wild preferred in Traditional Chinese Medicine: more potent
- ◆ Minimum value of resource to States is about US\$18 million
- ◆ Disparity → income generated by ginseng collection and sales and amount of dollars for program.

MANAGEMENT PROGRAM

Since late 1970s

USFWS has administered a ginseng management program whereby states collect and submit to USFWS 3 types of information, which is used by the federal gov. to approve export from qualified states:

- 1) ginseng harvest and commerce
- 2) population status, distribution, abundance, protected lands
- 3) laws and regulations - laws must show that state has:

Around 20 states (export wild and cultivated)

Additional 5 states (export cultivated roots only)

An increasing number of states outside natural range

USFWS evaluates quality and meaning of:

Harvest and scientific information

Reviews ginseng laws/regulations passed by states to regulate collecting seasons, practices and places

Determines whether export of ginseng should be approved or denied from individual states. Usually export approval is good for 1 to 3 years.

Point out - no state is required to submit information on ginseng harvest, laws and regulations, but **federal export approval hinges** on specificity and meaning of information submitted by states -- in best interest to submit reliable data and have laws enacted.

Growing concern about and evidence of lower harvest, decreasing size of roots, greater roots per pound is forcing USFWS to reconsider the methodology used to approve export

ACCOMPLISHMENTS

- program provides a structure or framework for gathering harvest information;

FOR EXAMPLE

- USFWS requests that states submit annual program reports containing information on ginseng harvest levels, conservation, population status, etc. Reports help federal and state managers evaluate harvest and population trends.

ALSO

- program has encouraged or pressured states to take to legislative action to increase protection for ginseng. without the program, states may not have been inclined to act.

Various administrative and legal measures have increased protection for ginseng and made harvest/trade more transparent and easier to monitor:

- designating harvest seasons through legislation
- setting minimum size standards for plants
- instructing diggers to plant berries in area of harvested plants
- requiring dealers to register with the state in which they do business
- requiring dealers to keep documentation of transactions with diggers and other dealers
- requiring dealers to have their wild roots inspected and certified by state officials

ALSO

- streamlined certification process by allowing registered dealers to self-certify cultivated roots (difference in appearance reduces fraud).

SHORTCOMINGS

GENERALLY, there are a few practical and administrative limitations that undermine the program's utility and effectiveness.

Most serious:

- **Insufficient resources**
Single largest impediment to collecting information and inspecting/certifying wild roots at state level is lack of \$\$\$\$\$.
- Takes resources to set up state program, maintain dealer registration system, pay for inspectors to certify dealers' roots.

--- Look at mechanics of trade and process by which the legal collection of wild roots is verified or validated.

Discuss diggers (hundreds to thousands in states)
Discuss dealers (ranges from 100 to 12,000)
Discuss State inspectors and certification
Discuss state adminis. office
Discuss OSA and OMA

Certification is process whereby states physically check dealers roots against dealers' transaction records to verify the number of roots being certified by state is the amount purchased by digger from diggers.

STRESS IMPORTANCE OF HARVEST INFORMATION

-mentioned earlier, lack of resources precludes states field studies to obtain data on ginseng abundance, density, status, ecology, etc.

- in lieu of population and ecological data, the most readily available data that are used to determine ginseng's status by state and county is total roots harvested and number of harvested roots per pound;

-- Ginseng is unique in that its rhizome (rootstock) increases in size and weight for each year it is in the soil --> use this characteristic to measure age structure of pops.

-- # of roots per pound can provide an indication of the age structure of a wild ginseng population;

-- in theory, the more ginseng roots it takes to make a pound, the younger the plants being harvested

--in practice, very few states submit number of roots/pound data; yet this is the most reliable set of data available to assess health of populations

THE PROCEDURE BY WHICH DEALERS REPORT ROOTS TO INSPECTORS FOR CERTIFICATION CAN BE ONEROUS AND INEFFICIENT

WHY PROBLEMATIC?

- 1) dealers or state officials travel (great distances) so dealers' wild roots can be inspected and certified - leave roots behind
- 2) root lumping --> impossible for state officials to obtain an accurate sample of number of roots per pound from dealers who lump roots purchased from multiple diggers
- 3) state officials weigh roots already weighed by dealer, duplicating the process

KEY CONSIDERATIONS

-- Dealers are the key to monitoring trade, reporting harvest, promoting legal harvest:

-- level of trade where accurate information on harvest and root counts can be recorded more accurately and efficiently

-- already submit transaction reports to state offices monthly; SO

-- dealers could submit more reliable data on number of roots per pound for specific geographic areas by asking diggers in which county(ies) roots were harvested

-- can reinforce state laws and regulations by reminding diggers about when and where to harvest ginseng.

Federal managers are realizing the complexities and limitations of monitoring ginseng trade and collecting harvest info. under current system

Ironically: retaining current system for ginseng might be better
dealers know the system (modifications -> retraining and re-educating)

Contrary to popular expectation, ginseng dealers even favor government intervention and regulation and in the words of one dealer "without government control, there would be no umpire in the ball game"

Goldenseal

New approach that acknowledges role of industry and dealers in monitoring a resource from which they benefit financially

-Consumption patterns, opposite of ginseng (85% domestic; 10-15% exported)

MAJOR DIFFERENCES:

- Greater participation of industry, including Trade Assoc. (AHPA), grassroots organizations (UpS) and individual dealers
- Less involvement and administrative oversight of states

INDUSTRY PARTICIPATION IS LIGHTING THE FIRE BENEATH GOLDENSEAL MANAGEMENT AND CONSERVATION EFFORTS

HARVEST DATA FROM DEALERS

- 1) Traders/buyers (NOT STATES) gather and report harvest data
Onus on dealers to prove legal acquisition; mention voluntary submission
- 2) State, in theory, relieved of conducting certification - dealer self-certification
- 3) State certification replaced with dealer self-reporting

CULTIVATION

Unlike ginseng, commercial cultivation of goldenseal is in its infancy.

Only 2.5% of goldenseal was produced in 1998 (cultivated sources).

Industry concerns about heavy wild sourcing/future supplies of goldenseal →
Stimulated interest in goldenseal farming (forest farming).

POPULATION STATUS

On a voluntary basis, goldenseal brokers with whom diggers interact are distributing questionnaires to diggers for feedback on harvest location, amounts and methods.

Questionnaire:

- ◆ A form of monitoring that taps knowledge of diggers by working with dealers (serve as middlemen).
- ◆ Could yield information about resources not otherwise available to managers and will help FWS assess population status.
- ◆ Active role of industry is replacing the need for direct state administration of the program.
- ◆ States can devote more resources/time to population surveys, ecological monitoring, dealer spot checks, etc.
- ◆ Goldenseal program represents the best of industry and government participation.

And provided it succeeds

- ◆ Might be a useful model for proactively monitoring trade in other medicinal plants of conservation and a viable substitute for CITES regulation.

Ethical Implications of Appropriation of Indigenous Knowledge for Commercial Exploitation

Associate Professor Stephen Schnierer
Southern Cross University Lismore

I noticed some things said by the last speaker, Robert McGowan, which have caused me to shoot off from my prepared talk. There was a mention of the Y262 case which I have had some involvement with recently at the end of last year. I was invited to give evidence to the tribunal sitting in Rotarua and the case of the Maori taking the New Zealand government to Court over their breaches to the treaty in preventing Maori people from conducting their traditional environmental management practices. This led to the destruction of the environment over there. I was part of a contingent of two other international speakers along with Daryl Posie. I don't know if you have heard of Daryl but he hails from Oxford University and he has written a book on traditional indigenous resource rights which is quite an interesting text. It stems to be a guiding light for indigenous people on an international level focusing on how we deal with some of these issues enforcing our rights to ownership of biodiversity, plants and animals.

The other guest who comes from Peru, has also been involved on a international level particularly with the Convention of Biological Diversity ensuring that the implementation of article HA in relation to traditional indigenous knowledge is pushed at the international level and comes through at the national level. It was interesting to see Y262 sitting there on your paper having had some connection.

I also noticed on one of the overheads mention of Mona Jackson who I had the pleasure of meeting in 1993 not long after they had developed that statement on indigenous rights. He was invited to a Conference at which I gave a paper on biodiversity and indigenous rights in Cairns in the Daintree and that conference came out with a statement which was the statement of the Aboriginal people of the Cairns area of which there are 13 nations. It was an assertion of their rights to the plants and animals that are found up there in the wet tropics. It was a pleasure to work with Mona and the international exchange from New Zealand to Australia empowered us to take it to another level. To work on our right in relations to the ownership of biodiversity so it was a nice connection to see that.

Just reflecting on what was being said about the Maori people, language has become a very key component in New Zealand now for Maori people and I have just come back from a conference in Hawaii, an international indigenous conference on education. It impressed the Australian indigenous content very much with the islands particularly New Zealand, Hawaii, the Solomons and various others that they used their language very strongly! We came back very fired up to make sure we are going to do something about the preservation of our language. Language is very important in terms of knowledge of the environment, plants and animals. Language describes the plants and animals and how they were used. If we lose that language we are going to lose a vast library of knowledge. In the Bunjalung nation we have a few elders still fluently speaking the language and we are going to work very hard to preserve it and teach it to the younger kids. It is a very important component in relation to anything that we talk about whether it is environmental, protection or conservation and sustainable use of the environment, or the equitable benefit sharing. It comes from a cultural basis with its feet firmly placed in language.

It is rather a sad irony that as we head towards the next millennium, which I think for indigenous people will just be another day, but for Westerners the next 2000 years has some sort of prominence. It is sad that the dawn of this next 2000 years, and I might say that this whole concept

of millennium comes from a Christian philosophy which in the past has been used to dispossess various peoples of their lands under the guise of paganism to some other method of looking at the world. As we head toward this new millennium we hold high hopes that society in general is becoming a more just and fair and equitable society where the values that we hold are changing for the better. It is a political situation as the last speaker said, we cannot extract politics from anything whether it is about knowledge, economics, morals ethics etc - it is all political. It is about who controls the power, the ethic and economics of laws etc.

Aboriginal people and other indigenous people around the world are very well aware of the control mechanisms that have been put in place. It is a sad irony that as we move into this new millennium and there seems to be some sort of feeling that we are going to take another step in terms of our common base as biological beings, that indigenous knowledge is becoming valued, whereas in the past it hasn't held much value. You might say isn't this a good thing. I feel that it is sad that this knowledge is being valued for commercial reasons and in separation from the owners of that knowledge. In fact to me, it represents yet a repetition of what happened in Australia 200 years ago or what happened in America 400 years ago when the ships set out from their bases to find new resources to support a culture far away from that land. Previously it was about plants and animals, minerals etc that could be taken from those lands in order to make them rich.

Yet you would think at the dawn of the new millennium we would have learnt something from this history of dispossession and theft. It appears that we haven't and that we are moving in the direction of address this. I should suggest not fast enough. The value of indigenous knowledge is a good thing because it links to indigenous people. The unfortunate thing the use of indigenous knowledge to develop new pharmaceuticals etc represents just another exploitation of these people unless it is done in a way that involves these people. The herbal industry is no different in my eyes to the pharmaceutical industry that sees the use of biodiversity purely in a commercial sense. We are not doing this just because we want to do it - we are doing it to make a living out of it.

I would hope though, that there is a growing ethic that comes from a growing understanding of the history of what has happened to indigenous people across the world. I would hope that there is some reflection on what has happened and some decisions made about whether what has happened is right or wrong - whether we need to address that and turn it around. I would hope that we do, given how fast these ideas have come today. I see hints of this happening but I don't see it happening fast enough. We need to be looking particularly in Australia who is a minnow internationally, but does like to get up there and be involved in things, and try and have an impact internationally. Yet we are trying also to be a member of an international community, while at the same time passing racist legislation which oppresses the cultural practices of indigenous people in this country.

That comes about because people in government - and I am not referring to any particular government as they all make policies - continue to oppress indigenous people. We have a NSW state government that has a fisheries department with legislation that prevents aboriginal elders going down to their beach and collecting more than 50 pippies in one day. That is cultural oppression when it has come about because of the ignorance of the long history these people have has in harvesting these resources. It has come about because there is no knowledge, ignorance and in some cases there is knowledge about this devaluing aboriginal culture. There is a continuing push from within government agencies to try to assimilate indigenous people and prevent them from practicing what is inherently their right.

So we still have governments in this country at both the national and state levels with legislation that continues to prevent indigenous people from cultural practices. This cultural practice is important because it maintains that vast library of knowledge of the environment, biodiversity and plants and animals. To continue that kind of oppression is running in the opposite direction to what has been said both nationally and internationally regarding the protection of biodiversity.

It has been stated quite clearly at many international conventions that what we have to do today is conserve and protect the biodiversity, plants and animals ecosystems that we see around here. Unfortunately we do not see these things as more than things we are going to use, we seem to lose the spiritual connection. I think that this is the difference between indigenous knowledge and the great western machine that seems to be churning along in one direction, chewing up and spitting out.

This is the thing that keeps me working in the education area as I believe that the only way that we can do this is to raise the awareness of our Aboriginal people. Our governments need to be held responsible for the policies which they hoist onto aboriginal people. I don't see our government making decisions for us. I see the governments around the world making decisions that favour trans-national companies to make huge profits. I see the establishment of GATT as an example of trying to harmonise intellectual property rights to try to match those kinds of laws that we find here. Let's harmonise those property rights here in Australia as they have in America. That kind of approach leading to the appropriating and theft of indigenous knowledge not only in Australia but across the world.

We have signed the GATT agreements and the government is now saying that they can't do things like passing legislation protecting indigenous knowledge as it goes in counter to this GATT treaty. These are international documents that have been placed to free up trade because we live in a global society and unfortunately the freeing up of trade is leading to continuing oppression of indigenous peoples. Even though we do have on the one hand conventions like the Convention on Biological Diversity which seemed to say opposite things, we seem to be getting support from the very same countries which have signed these other agreements.

The power to change this has to be with individual people in various areas in the herbal industry. We are in a position to look at these sorts of issues and change what is happening. Reflect on some of the traditional medicines that you are selling. Is this something that will feed back to aboriginal people and the traditional owners of that knowledge? Does it supply benefits that will empower them? We are the most marginalised group in this country and if you go to other countries you will find indigenous people, unless they are in control, are one of the most marginalised groups in society. They have the lowest health standards, highest incarceration rates you will see this repeated over and over again. This is because we do not have resources and we are controlled, yet we have a valuable source of knowledge that could be used to empower our communities and give them the skills to be able to negotiate with government.

What is needed in all areas is for individuals to think about the implications of what they are doing. It is a great thing to be stimulating this kind of industry because of the sustainability factor but what is it doing to indigenous people if they are not included.

Billions of dollars are made each year in pharmaceuticals on knowledge that was taken from indigenous communities yet those very same communities are marginalised. We have to look at our practices and think that although the herbal industry may be good for the environment and will lead to sustainable practices we must remember that indigenous people are part of that component.

There is a moral obligation to take this into consideration. Indigenous people have interacted with the environment for millennia. In Australia this can be shown at least back 50 or 60 thousand years. That interaction was a two-way interaction. It shaped aboriginal culture in various nations. We are not only shaped because we use these things but because we have stories and lore about them. This helped to place aboriginal people in a much broader context. You cannot separate indigenous knowledge from the cultural context.

What is needed in these kinds of industries is ethical practices standards and protocol that need to be adopted by national associations and disseminated out to people who work on the ground. Individuals will then be empowered with the knowledge as to what is happening with the indigenous knowledge regarding plants and animals and their use.

There is a lot of knowledge out there I talk to my Elders on a regular basis and they constantly throw up names of plants and animals that we use for certain things. I know that some of this information is not out there yet. Our people are quite happy to share that knowledge as long as then can control the use of it and they understand how it is going to be used. That will not happen unless indigenous people are secure in the arrangement that is set out between themselves and those seeking that knowledge. This requires a joint ethical approach from industries like the herbal medicine industry.

We have great difficulty getting legislation passed in this country to protect indigenous rights. One of the reasons being that it is a western system which recognises individual rights through copyright and trademark etc. Aboriginal knowledge is community owned knowledge. Based on the western legal system this is very hard to protect. We have to put that mechanism for protection back to the people who are seeking access to the knowledge. We must appeal to your ethics and morals to ensure that history isn't repeated and we don't have an invasion of indigenous minds. It is up to the industry to look at these practices. If you are unaware of these sorts of issues then it is up to you as individuals to seek out that information. I will leave you with that thought.

Thank you

PURPOSE GROWING of PHYTOPHARMACEUTICALS

Tim Riordon
Autana Pty Ltd

Purpose growing is a term I use to differentiate between the growing of plant species for purely economic reasons and the growing of plant species as a component in a designed eco system with a focus on end use.

In both instances the production methods may result in high quality plant products, the difference becomes one of an ethical and philosophical nature. If we are to supply the market only if it is economically viable then it is unlikely, especially with regard to medicinal plants, that herbalists will be able to source many of the species they desire for their work, or if such species are available the quality and for price may be unacceptable.

The focus at all times should be on the end user - the practitioner and the patient. The challenge is to devise management systems that ensure no participants in the herbal industry are disadvantaged in comparison to others. All should be valued equally.

The Big Picture

In the next few decades the consequences of environmental abuse will affect all of us regardless of who we are or where we live. The skills of Traditional Medical Practitioners will be needed more than ever before as the combined effects of global warming, ozone depletion, chemical, radioactive and electro-magnetic pollution become more obvious.

We are all challenged. Modern medicine with its focus on treating symptoms is in my view "shooting the messenger". The surgical removal of a tumour, for example, does not provide the answer as to why the tumour occurred in the first place. How many of us know, or think about it, when we drive our motor vehicles, that unleaded fuels are comprised of around 50% in the form of volatile aromatics, such as benzene - all known carcinogens and that except when the engine is hot and the catalytic converter is functioning (for around 50 - 80,000 kms beyond which it should be replaced) these volatiles are being discharged directly into the environment to be absorbed through the skin or respiratory system. Is there a connection here with asthma or lung cancer? And this is only one pollutant!

Global Warming is allowing the spread of diseases such as malaria into temperate zones. Deforestation, apart from desertification, loss of bio diversity etc. also allows for the spread of disease - for example, ebola. This disease is thought to be associated with bats, and bats have entered urban areas seeking habitat following forest removal. The effects of ozone depletion and increased ultraviolet radiation are having noticeable effects. It could be that increasing admission of ultra violet will have disruptive effects on the biochemistry of herbal medicinal plants. Adverse effects are being noticed on phyto plankton populations in the Antarctic! (For interest an Ozone hole exists also in the Northern Hemisphere). Chemical, nuclear and genetic modifications are showing links to genetic abnormalities. In respect of the two former pollutants, these abnormalities do not always appear for some generations.

What to do?

Work collectively to develop strategies that deal with these problems. In my personal situation, I developed an awareness of herbal medicine following treatment with St. John's Wort for nerve sheaf damage, a problem not remedied by three operations, was totally resolved with herbal treatment. Co-incidentally the herb also grew on my land where it was classified as a State Declared Noxious Weed. For me, moving toward organic production, the harvesting of flowers meant the same control effect as annual spraying without the negative effects. In respect of St. John's Wort, most of the really potent plants are growing in areas that are chemically clean, as most

landholders have not been able to afford to spray. The opportunity for landholders to derive an income from "weeds" was appealing and also had support of Weed Control Authorities (as Weeds Authorities were in a 'no win' situation). As it appears in the case of St. John's Wort, continual harvesting on the same land area may be unsustainable - the opportunity was there for landholders to enter into Agro-Forestry to provide a long term cash flow, gaining the benefits from carbon trading and tax concessions. In this way a wild herb provided opportunities for many landholders. More recently, I have been involved with a farm forestry project in the Central Tablelands of NSW. Initially, the emphasis was on *Pinus radiata* but now embraces multi-use farm forestry. Herbal medicinal trees, shrubs and ground flora can be incorporated into the species mix if appropriate. In our case a sub-committee has been formed to examine the potential of this approach.

This raises the next point. Australia still enjoys many advantages over other countries as regards the "health" of our environment. We have a wide range of climatic types and soils providing the opportunity to grow most species of medicinal herbs. However, as our population is small, we find that most producers are competing for a limited market share and most phyto-pharmaceutical companies operating within Australia are focused on the domestic market.

Six months ago enquiries were received from a major overseas company who wanted to exploit the Australian market for their products. I have taken the enquiry to where, in principle, agreement has been reached to manufacture phytopharmaceuticals in Australia for sale to Europe and North America from Australian grown herbs. The interest expressed from Australian growers has been extremely strong and we have around 600 people, all organic growers, interested in participating. Approaches are on a bioregional basis and the area covered extends from North Queensland to Victoria. Each bioregion would be a collective and participants would be involved in the vertical integration chain to sale of manufactured product. It is hoped that critical mass can be achieved where the production under licence, funds development of other herbal products, sharing facilities for export.

Each bioregion would grow herbs specifically suited to the region's climate and soils. The collective approach and the scale of such a project also allows for research into methods to deal with situations created by environmental abuse mentioned earlier. However, one of the strongest features of such a collective is the personal contact from growers through to practitioners and patients. This can create an industry where ethics are maintained. A dynamic proactive body that could conceivably survive any readjustments of the growth economy better than hierarchical structures, driven mostly by the need to provide profits for shareholders.

A collective, bioregionally based industry where all participants are valued, certainly is more akin to the traditional herbalists, who grew, gathered, prepared and treated themselves, than an industry where high quality herbs can be degraded during processing and offered for sale to practitioners and users alike and growers are not valued. It can be stated that herbal practitioners are, in those circumstances, not valued either, other than as consumers.

To survive the challenges of the new century, we have to refocus, overcome our niche market approach and embrace the opportunities we in Australia share. The examples I have used are illustrations of opportunities there for us all, opportunities at once sustainable and ethical.

Thank you

AUSTRALIAN GINSENG THE Paddock OR THE BUSH?

Charlene HOSEMANS, Ron WILLS, Fred HOSEMANS, Peter JOHNSON
Australian Ginseng Growers Association Incorporated
AUSTRALIA

Introduction

During the first fourteen years of growing ginseng in Australia, the main emphasis has been on the establishment of chemical-free, forest floor ginseng crops in the Australian bush. Organic aged roots, from the first garden, started in Victoria in early 1985, are exported to Asia and also supply raw material for an Australian ginseng retail product.

Encouraged by the success of this first garden, and because less than 5% of total world ginseng production comes from forest cultivation or wild harvest, more than 1000 additional gardens have commenced in bush locations since late 1992. The first multiple-farm harvest of chemical-free, forest floor crops is expected early in the 21st Century.

However, as the interest in ginseng farming has grown, the interest in establishing artificial shade crops in a paddock situation has also developed. While some new shade gardens are starting to show promise, there have been far more failed attempts in the paddock than in the bush. Because of the potential for earlier returns and often higher weight yields, growers are keen to develop cultivation techniques whereby paddock crops can be successful but remain chemical-free.

High on the Australian Ginseng Growers Association's agenda is finding an answer to the question "Should Australian ginseng growers continue to aim mainly for the top quality niche markets or is there potential for producing large quantities of high quality ginseng as direct competition to other artificial shade harvests?"

To that aim, an ongoing research program designed to identify the strengths and weaknesses of these two cultivation methods is underway and has substantiated the high quality of Australian bush grown ginseng, already accepted in the Asian market place. Quality levels of Australian paddock grown ginseng are also very encouraging. However, difficulties with cultivation techniques appear to be no less complicated or costly than for other large artificial shade producers. Also, the ability of growers to produce large harvests of chemical-free roots seems nearly impossible if using common intensive monoculture principles.

Recorded Australian imports exceed 20 t/year, with an estimated value of \$AUD12million. The increasing consumption of ginseng in Australia is the result of the rising proportion of the population of Asian origin and the heavier demand for natural health products in society in general. With world stocks of wild ginseng diminishing, plus growing demands for better quality, chemical free products, there is clearly potential for Australian commercial ginseng production as an export commodity and for import replacement.

This presentation describes some of the initial findings of the Australian ginseng research program, currently underway at the Newcastle University, New South Wales. From the outset, it is important to recognise that this presentation will only serve to provide the Conference with an initial overview of Australian ginseng production and research. Until the final report from the current three-year research program has been made, no conclusions can be drawn. Conference delegates and readers of this paper will be interested in the fact that the obvious focus in establishing the Australian ginseng industry is on quality before quantity. It is also hoped that your appetites will be wetted sufficiently to encourage your participation at IGC 2003 scheduled for Melbourne, Victoria.

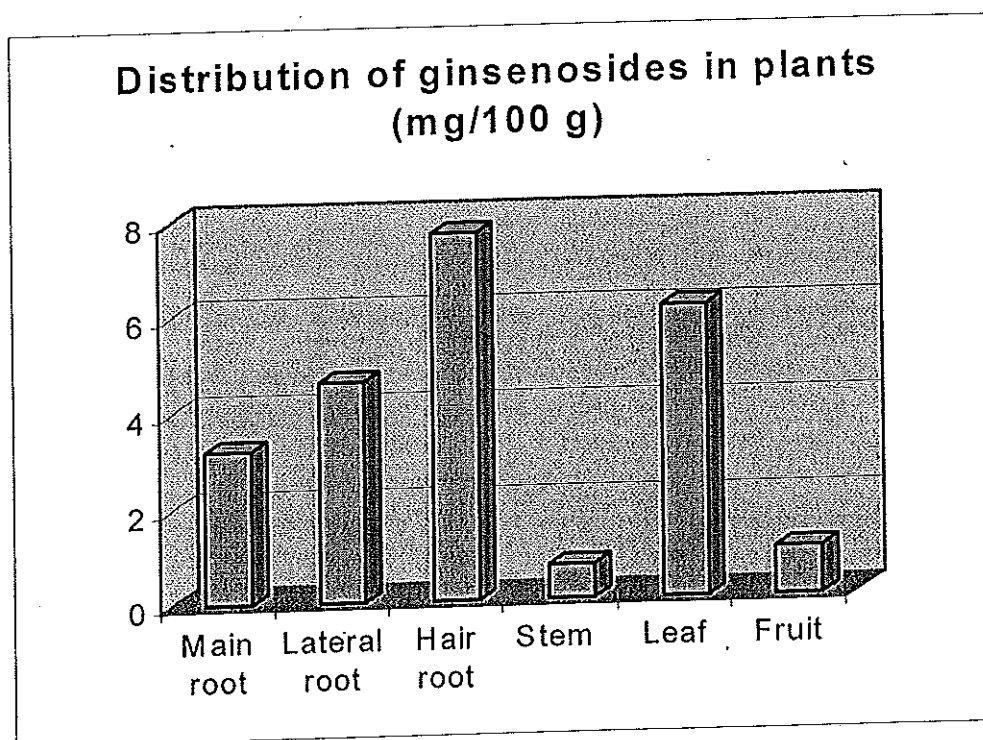
Research Program

A research project titled 'Production of High Quality Australian Ginseng' commenced in 1998. The project is funded by, (a) the Federal government through its Rural Industries Research and Development Corporation, (b) the Industry and (c) the Research Organisation, University of New Castle. The objectives of the project are to correlate growing conditions and agronomic practices with crop yield and levels of ginsenosides in Australian grown *Panax quinquefolium*, to optimise postharvest handling and processing operations, and develop quality standards and rapid testing procedures. The data will generate improved growing systems and postharvest technologies, which will be utilised by the Australian ginseng industry to market high quality Australian grown ginseng internationally.

Initial Research Report

The Australian Ginseng industry is aiming to be a marketer of high quality ginseng products. While quality has many meanings in the industry, with the shape of the root being a dominant factor in traditional Asian markets, we believe that increasingly, consumers will be looking for quality as defined by the level of active constituents, which convey a health benefit. Ginsenosides are probably the most important group of compounds giving health benefits.

The first stage of the Australian research project conducted at the University of Newcastle by a group led by Professor Ron Wills has been to look at levels of ginsenosides in different plant parts over the growing season. While the last sample in the growing cycle has not yet been analysed, the results to date show a wide range in concentration of ginsenosides in the different plant parts, with the highest levels being in hair root and leaf and the lowest levels in stem and fruit. This is illustrated in the attached bar chart. By contrast, the levels in the different plant parts were relatively consistent over the growing period.



A study in progress is determining the level of ginsenosides in about 30 retail ginseng products available to Australian consumers. Preliminary data shows there is a wide range of concentrations present in the products, ranging from near zero up to about 9mg/100g. In the 1999-harvest season, the research program will look at variations in ginsenosides in roots of different age and different growing locations and at the effect of postharvest handling and processing on maintenance of ginsenosides.

Data Collection

In an attempt to identify strengths and weaknesses of the various cultivation techniques currently employed by Australian ginseng growers, research is being carried out in the field as well as the laboratory. Data collection by way of written surveys completed by the individual growers, as well as on-site visits by research staff have commenced. It is aimed at identifying problem soils, potential pests and diseases, and adverse climatic conditions which may contribute to low success rates in some areas which otherwise appear to be suitable.

The Australian Ginseng Growers Association considers this work is vital to ensure as many new growers as possible are assisted to achieve successful crops by being able to avoid or overcome any major problems that may be identified in their ginseng gardens.

Current Cultivation Technique

Materials

Both *Panax quinquefolius* and *Panax ginseng* C.A. Meyer are under cultivation in Australia with the ratio being 80% *Panax q.* and 20% *Panax g.* Australian grown seed production has not yet reached sufficient levels to provide any surplus for sale. New gardens are planted mainly with imported seed in either winter (June-August) or spring (September-November) and/or Australian grown 1-year-old rootstock in late autumn/early winter. Australian grown seed is planted in late autumn (May).

Seed Propagation

Prior to 1997, imported 'stratified' seed (12months old) was planted in October-December and generally, did not germinate until September-October the following year. This lead-in often meant crop failure due to poor conditions caused by lack of experience or perseverance of the intending grower.

In the last few years, imported 'green seed' has been successfully 'stratified' to produce good germination after twelve months (ie harvested in the Northern Hemisphere in Sept.'97; exported to Australia in Oct.'97 for stratification; planted in Australia in July/Aug.'98; germinated in Sept.'98).

To increase the Australian grown seed production, most growers establish seed production beds under artificial shade regardless of the fact that their main gardens are in forest locations.

Until Australia becomes self-sufficient with its own seed production, this in-house stratification of imported seed has increased the potential for new growers to establish their gardens with a greater likelihood of success.

Methods

Approximately 70% of ginseng being cultivated in Australia is planted in forest locations. Approximately 80% of all Australian ginseng gardens are being developed under stringent, chemical-free principles.

Australian forests are predominantly treed with eucalypts, which often do not provide adequate shade for ginseng. While proving to be virtually disease free so far, and also relatively free from wildlife predators, there are some factors that may need to be adjusted or adapted to ensure ginseng's needs are met by Australian forest conditions.

Artificial Shade gardens are being established at a slower rate than many similar gardens in the Northern Hemisphere. Australian growers hope to avoid some of the problems that occur when ginseng is established very quickly in a non-native habitat. Sophisticated machinery, specific to ginseng farming, has not yet become an issue for most gardens.

Natural Shade and Mulch

While our forests are not deciduous, there is a constant shedding of leaves which you could assume would provide a good thick mulch. Thick is the word. Gum leaves collect on the floor in a leather like blanket and if left undisturbed, greatly inhibit good germination by trapping the emerging sprouts so that they may never reach daylight and consequently die in their attempt. Also, due to the slow rate of decomposition, natural feeding of the soil from gum leaf litter is extremely slow compared to the deciduous leaf mulch of the Northern Hemisphere forests.

Addressing these two main problems means that additional shade often needs to be provided under the trees and mulch materials need to be imported to replace leaf litter in the chosen site. Why then is forest production in Australia so popular when it is more costly and time consuming than for the Northern Hemisphere woods grower? It all comes down to the dollar value of the crop. We know that niche market returns of forest-grown ginseng generally far out value crops grown solely under artificial shade.

Not all Australian forests require adjustments however and currently, about 20% of forest production is established in locations that have natural closed canopies with a predominance of middle story trees such as Blackwood, Tea Tree, Hazel and tree ferns. These sites are proving to be extremely productive due to the fact that the softer shade canopy provides a leaf litter, which decomposes more quickly than 'gum' leaves, resulting in higher organic content and nutrient levels for the ginseng, planted in these soils.

Pests & Diseases

So far the Australian ginseng industry appears to be relatively disease free with crop failures to date caused either by pests, incorrect site preparation, or poor site management. Many problems relate to excessive moisture more than dry conditions which proves the statement that ginseng will survive a drought more easily than a flood. In a dry continent like Australia, this is great news.

Undoubtedly, as time goes by, growers in Australia will experience their own problems with pests and diseases affecting ginseng crops which may be very different to those experienced by growers in other countries. For example, North American growers are troubled by *Alternaria* leaf blight, which is a fungus affecting leaves, but is not currently known in Australia. Root rot is another disease affecting ginseng, and Australia does have its fair share of *Phytophthora* species (eg. *Phytophthora*

cinammoni - "Cinnamon fungus"). Other major fungal diseases that may affect roots or leaves include *Rhizoctonia*, *Pythium*, *Ramularia*, *Verticilium* and *Fusarium*.

Animal pests include rabbits and wallabies nibbling leaves; and wombats, bandicoots or lyrebirds digging up roots during their foraging for other food (they may eat ginseng roots, but their activities usually damage and destroy roots instead). So far, lyrebirds have created the biggest problem and all gardens located in areas where these birds roam are protected by wire mesh pegged down over the planted sections.

Slugs and snails are major problems for growers on previously cleared and cropped or grazed land, as are other pests, including the larvae of beetles, such as corbies, cockchafers, and cutworms. Indeed, most problem pests and diseases are associated with previously cropped soils, or pasture land. However, these problems are rarer on uncleared or un-modified land, making forest floor cultivation a more attractive choice, especially for the grower who wishes to utilise non-chemical farming principles.

Industry Crop Evaluation

To assist and encourage a ginseng industry being structured predominantly on organic or biodynamic principles, AGGA conducts a crop evaluation system for its members based on AQIS criteria. It is considered that this evaluation process will be a valuable market tool for growers who wish to attract buyers seeking chemical free crops.

Preliminary Conclusions

The finding of the research program substantiates the high quality of Australian bush grown ginseng, already accepted in the Asian market place. Quality levels of Australian paddock grown ginseng are also very encouraging. However, difficulties with cultivation techniques appear to be no less complicated or costly than for other large artificial shade producers. Also, the ability of growers to produce large harvests of chemical-free roots seems nearly impossible if using common intensive monoculture principles.

Australian researchers, encouraged by the quality of Australian grown ginseng as identified by their work, are keen to work with others to establish international testing and identification standards.

At this stage, we conclude that Australian ginseng growers will dig more 'gold' in the bush than they will in the paddock.

References

- Hosemans, F & C 1993 revised 1996: Ginseng Growing in Australia
- Wills, Prof RBH 1999 University of Newcastle, Australian Ginseng R & D Project
- Johnson P 1998: Pest & Diseases of Ginseng in Australia, AGGA Conference, Canberra

NATIVE FOOD, PLANTS AND MEDICINES - RESEARCH NEEDS AND OPPORTUNITIES

Peter Hardwick

Native Food Industry Pioneer

There is a lot of overlap between bush foods and native medicines. Certainly a lot of the issues that you are dealing with now with the native medicines - looking at going into native medicines and their uses by non-indigenous people - are very similar to a lot of the issues that I was facing fifteen years ago. In fact, I started two years ago dealing with the botanical prospecting of the local bush foods, and certainly I hope to be able to provide a few stories, and a few ideas on how you might be able to deal with some of the issues from the experience we have had with the bush food industry.

During the session I will underline some of the mutual issues shared between the Bush Food Industry and the Herbal Industry. Later in the session I will also outline some of the bush foods with the potential to be developed into medicinal products.

Terra nullius, by its very nature, contradicted acknowledgment of Aboriginal culture including indigenous food value. The supposed moral basis of European conquests included the erroneous precept that Aboriginal people do not utilise the land effectively, and that Europeans were making the country productive by clearing the supposedly useless bush. Regardless of this prejudice, native Australian plants have been used for medicine and food by Europeans and of course by Aboriginal people for thousands of years. The issue of native plant-value has been undergoing its most dramatic renewal in recent years and raises many ethical issues.

One of the first indigenous Australian medicines used by Europeans was the native sarsaparilla, *Smilax glycyphylla*, which became an item of trade in colonial Sydney. Later corkwood, *Duboisia myoporoides*, was developed as a source of alkaloids used for eye surgery, cardiovascular drugs and anti-nausea travel sickness tablets. Eucalyptus and Tea Tree oil was used for anti-microbial qualities and Eucalyptus is also used in a range of other light medicinal uses and as herbalists, you would be aware of that probably. More recently, native medicinal applications include Bush Flower Essences and Aromatherapy. Tea Tree oil production is one of the apparently successful examples of modern Australian medicinal plant usage, although indigenous intellectual property rights do need addressing with that industry.

While not forgetting that there was colonial folk use of native foods, generally they are not considered suitable for commercial production. The Macadamia nut is the most prominent native Australian food to become developed into a food crop and in fact it was the native equivalent of spinach - best known as Warrigal Greens - which was the first native food cultivated by Europeans, after the seed was taken back to Kew Gardens by Joseph Banks in the 1770's. Not many people know that.

Maiden, a botanist of the late nineteenth century, also made encouraging comments with regards to the commercial potential of many native foods, but these ideas were not taken up at the time. I think that they were just too contradictory for a culture which really was imposing onto this landscape rather than working with it.

In the late 1970's, I initiated a systematic evaluation of sub-tropical native food plants to identify those species worthy of cultivation. This was to highlight the biodiversity value of rainforests, then under threat from logging. Other industry pioneers have followed, and since the mid 1980's, the Native Food Industry has steadily broken down the two hundred year old entrenched prejudices and fallacies surrounding native food plants. There are now over fifteen sub-tropical native food plants

that have established a market and are being cultivated in orchards in this area. The majority are rainforest foods but there are also prominent nuts, leaf spices and the Warrigal Greens as a leafy vegetable. Needless to say there are many more that could be developed as well.

Native food plantations also included threatened species such as the rare NSW *Davidsonia* and the small leaved tamarind, *Diploglottis campbellii*. Many native plants are flavoured and are considered by some gourmets to be superior to many introduced foods. You would soon notice the difference if you compare the average modern tomato to a desert tomato, the akudjira. Many native foods like Davidson's plum and riberry are as productive as introduced horticultural crops, with native foods having the capacity to produce outstanding yields.

Native foods also prove to be a rich source of health providing compounds. Kakadu plum has the highest vitamin C content of any natural source. In fact Aboriginal people did practice horticulture and there is evidence they had basic forms of plant varieties, especially around some of the camp-sites. But these systems were often not in row cultivation recognisable by European people. We now appreciate in hindsight that aboriginal people managed the bush sustainably, comparable to an extensive permaculture system.

Native foods offer new industry and employment opportunities to regional Australia. This is at a time when competition is devaluing agricultural commodities and is squeezing farm profits and the environment. In the Northern Rivers region, we now have over half a dozen small-scale bush food based food processing enterprises.

As incrementally successful as we have been, the modern native food industry also has been limited by a lack of funds for research and development. It is the first time that so many entirely new food crops are being developed, and while offering opportunity, it stretches the skills base of the regional horticultural industry.

This process has also had its risks. While opening up the market with economic botany research and development, inevitably, unfortunately, unscrupulous entrepreneurs move in and have promoted the mass planting of inferior varieties without thought for marketing and quality. I hear this story so often repeated, and I know you have heard it in the herb industry too. This occurred with lemon myrtle and some growers had been left with an excess of inferior product.

In attempting to prevent this sought of problem the early day pioneers of the native food industry promoted the idea of farmers planting small scale mixed species trials, a way of cautiously assessing the ideal crop for each site. In the second stage you can go into more focused planting, and I know some medicinal plant people have talked about this style. This also avoids a glut of individual product, however many farmers are generally more at ease with larger scale monoculture cropping styles, as I had also talked about. The simplistic cash flow projections also suit accountants. The lack of understanding of the various stages of new crop and market development contributes towards the farmer's susceptibility to being duped.

Therein also lies the need to have ethical and committed players leading new industry initiatives, including native medicine development and of course, the finance sector need to be involved, but with a clear understanding of the industry itself. We're looking at very hard-core economics and industry here. We're starting to hear that promoters of potential new essential oils and medicinal plant crops are also talking about cautious new species trial plantings. These plantings consist of one acre or thereabouts to start with. Farmers are accepting this cautious approach to new crops.

Some of us in the Native Foods Industry have also worked this into partial regeneration of the native environment. The regeneration projects, previously considered radical, are now being

developed into organic standards and native food labels. In time, the combination of regeneration of the land and cropping will be seen as less and less esoteric. Farmer based movements like Landcare are also doing much to shift the attitudes.

Research has to be well choreographed during the development stage of the industry. Farmers involved with this process need to be clearly informed on each stage of the product's development and the extent of marketing. Bear in mind what happened with *Echinacea*, that was an excellent example as well. In the examples of native food plants that I provide today all of these are subject to research and development (R & D) if they are to be developed into medicines in their own right. Opportunities are there for those companies or individuals. However I generally find that most companies are reluctant to take on the fundamental early stage R & D due to its speculative nature. Nevertheless, there are collective features for a herb company looking to develop new products from native foods.

For a start, it is reasonable to generalise that native foods as medicines offer a degree of safety with regards to toxicology. This prospective should also interest the herbal industry and consumers and enhances the opportunity for developing these products. Recent developments in medicine of food extracts are prominent in the health food store and the pharmacy shelves, including cranberry and grape seed extracts. High potency extracts are sought by some but others prefer the use of the whole plant as a medicine.

On the very important subject of aboriginal intellectual property, I was acutely aware of this during early days when I was working on investigating the commercial potential of bush foods. My approach is acknowledgment and obtaining permission at the very least when using Intellectual Property, however I found myself often saying to the elders "don't tell me, this is what I am doing, I am working with commercial development, there are no protocols". It is like having one foot in one camp and another foot in another camp and I basically said I would prefer if you didn't tell me about anything that could be used commercially because it creates this contradiction to me in trying to work these things out anyway. This can be very hard to deal with.

However I primarily use my own perception and scan information available to make assessments on the commercial value of the various native food plants. I made it clear to many local Bunjalung elders that I was assessing native foods for their commercial potential, explaining my concerns about the lack of these protocols. To ensure equal opportunity for Aboriginal communities, the local Land Councils were also approached, needless to say, not very successfully at the time. They certainly seemed to have their hands full with land rights issues and other social issues in the communities.

Like other Bush Food Industry pioneers, I have also been involved with the setting up of projects in local communities. European culture also has its own interpretive skills on new foods, for example, as far as we can determine the use of Warrigal Greens was ascertained independently of indigenous culture - Cook's Endeavour expedition had previously encountered a similar edible plant in South Africa. In more recent times, we analyse essential oils from bush foods to isolate flavour components, also vitamin, mineral and protein contents have been determined. Gourmet recipes reveal the flavour qualities.

Analysis and analogies with overseas food plants have provided evidence of safety, but without traditional Aboriginal help, entirely new compounds remain out of reach of low budget methods. It is reasonable to assume that the vast majority of bush foods are rediscoveries of potentially lost Aboriginal knowledge and with this we need to ask, is it fair that Aboriginal people should miss out on the recognition and royalties because of their loss resulting from attempted genocide?

The prior custodianship of a genetic resource is a stronger basis for an ethical industry protocol that considers Aboriginality. Industry recognition of prior custodianship could be the basis for protocols and the standards involving indigenous people on an equitable basis. This could operate like an organic standard, with consumers responding to endorsement on labels, perhaps existing organic organisations could even play a role in this process. However it would require a lot of workshopping to achieve a suitable outcome for all parties. It is worthwhile considering that initial benchmarks should be encouraging and achievable for companies seeking to participate without the process being exploitive of indigenous people.

On the issue of wild harvesting, it has been my experience that individual plants usually vary in the wild, this being the reason why some companies prefer the consistency usually associated with cultivated plants. However batch testing bulk quantities of homogenised wildcrafted produce to a minimum standard should be sufficient. The reality is that farmers are the primary managers of this country's land surface. Needless to say, they clear native habitat to make income from cropping and grazing. The figures for native vegetation loss in Australia are shocking. The Australian Bureau of Agriculture and Research Economics recently estimated that over one million hectares of native habitat was cleared in Queensland alone from 1997 to 1998. That is only an estimate, but it is very worrying. Keep that in mind.

With the wild harvesting of native food plants, we have situations where the farmers are retaining natural strains of commercial species that would previously been cleared for agriculture. We have got a list of at least twenty species that we know are being saved by commercial harvesting.

It is contradictory to all that stuff that we have been hearing this weekend about exploitation from wild harvesting. It is quite an interesting situation to look at it in the context of Australia and what is really happening. There is clear anecdotal evidence that native food production is actually resulting in this market led conservation of biodiversity and there is every reason to anticipate that wildcrafting native medicine may do the same. Of course the ability to sustain the wild harvest varies with differing species and situation. Overseas the wild harvesting of golden seal and ginseng results in the loss of these species in the wild from because from what I understand, they are slow to grow and the whole plant is harvested. However, bush foods are being rotationally wild harvested and only a portion of any given plant is removed. This is far more preferable to annihilation of the entire habitat for income from agricultural clearing.

Ironically government regulatory bodies like the NSW National Parks and Wildlife Service have risked turning farmers away from wild harvesting from their own properties and back into clearing of the bush. In fact I have been told by Dorriggo pepper harvesters that the farmers would prefer to clear, rather than deal with government and red tape on wild harvesting. Fortunately the NSW National Parks scrapped the plan to control some native plants and seed collecting, realising the need to improve communications with the affected industries. This highlights that a more market led incentive approach to biodiversity conservation needs to be examined prior to new regulations being installed.

A recent Botanical Conference in the US presented worrying trends in the loss of plant biodiversity worldwide. It highlights reality that existing conservation strategies soon will not be capable of protecting habitat, especially in cash strapped developing countries. A particularly disturbing example of potential habitat loss on a huge scale is the increasing threat to Papua New Guinea's incredibly mega-diverse rainforest from logging and replacement of oil palm plantations.

We don't have to go far to find extinction of useful plants. Five years ago I went along with one plants commercial development so as to observe first hand whether profit is a useful means of saving biodiversity (although I must say I am not a fan of patenting Plant Variety Rights). Less than

one kilometre from here, going towards Byron township, I found resource material for a mosquito repellent plant now known as Mozzie Blocker. A particular type of lemon-scented tea tree, *Leptospermum liversidgei*, is now sold as a pot plant in supermarkets and nurseries. This food is unique as it contains isopulegenol which acts as a synergist for citronella, enhancing the plant's insect repellency to mosquitoes. The site where this plant originally grew has now been cleared for a real estate development. The unique qualities as a mozzie blocker™ would possibly have been lost forever if I had not been paid to collect it.

It would be excellent if there were many non-profit organisations that funded the ongoing work required to save the useful biodiversity of native plants, but the reality is something else. So what can we do? In the context of a market lead society that has been created, perhaps it is time to consider a difficult option. Is it better to have profit from biodiversity, including medicinal plants, with the hope of including an ethical protocol and profit-sharing clauses for indigenous people, or have ongoing biodiversity loss? As harsh as that question may seem, I find the idea of biodiversity futures, if it comes down to this, selling on the stock exchange, a better alternative than extinction.

Perhaps Papua New Guinea tribes people would welcome the option of profit derived from less destructive prior-prospecting leases for medicines and food, instead of rainforest logging and oil palm plantations.

Conservation Issues Associated With Use Of Native Australian Herbs

Andrew Pengelly
Executive Officer, NHAA

Summary

In this talk I will discuss factors involved in introducing native herbs into a western clinical setting; implications of commercial exploitation of indigenous herbs; Aboriginal involvement in the native herb industry; influence of the essential oil and aromatherapy industry; sustainability of supply of native herbs; offer an overview of the Stanley native herb project and introduce the Native Herb Forum.

1. INTRODUCTION

The Australian flora has always held a fascination for me, perhaps because of my love of the bush, and a strong desire to spend as much as possible being in it. For me the bush has always been a source of medicines, even though none of the western herbs I have learned about are found there. Nevertheless bush teas have long been used as beverages and for simple problems like headaches, and several years ago I began to include a selection of native herbs in specific compound tea formulations for my patients. Since then I have been a strong advocate for the use of Australian herbs, however I now realise that there are risks in exploiting our native flora without first ensuring the practice is sustainable and ethical.

2. INDIGENOUS HERBS IN A WESTERN CLINICAL SETTING

I have often wondered why there are no Australian herbs in the materia medicas found in our text-books and taught at colleges of herbal medicine. Why are most herbalist's dispensaries full of European, American and Asian remedies and not those from our own country? Why, with the exception of certain aromatic oils and flower essences, does the Australian Herb Industry ignore the possibilities of bush medicines?

There is reluctance on the part of Australia's major herbal medicine manufacturers to provide and promote products using Australian herbs. Most practitioners, apart from the minority who primarily source and manufacture their own medicines, are reliant on the major manufacturers for supply and product information - in my experience this amounts to little or no support of indigenous medicines.

One reason for this reluctance is the lack of available clinical data and or published monographs such as we find for major western herbs. Information that is available in published form relies mainly on observations of plant use by Aborigines, raising the issue of Intellectual Property Rights. In an attempt to address the shortfall of information I

initiated the Native Herb Forum one of whose activities is to publish monographs and data sheets on indigenous herbs (see below).

Another related factor is a reliance on overseas research for information. During my investigations into Australian herbs, most of the published studies I have seen were conducted at overseas institutions, generally on species whose distribution is not restricted to Australia. Some native medicinal species such as *Melia azedarach*, *Dodonaea viscosa*, *Rubus parvifolius* and *Solanum aviculare* are all traditional remedies in parts of Asia and America, and fortuitously there is a body of research on their use and safety. Most of the research conducted at Australian institutions is pharmacy oriented, the aim being to discover new pharmaceutical drugs or to identify chemical constituents that may act as starter molecules for new drug development.

Complex regulatory requirements may act as an impediment – especially the lack of safety data on Australian herbs. I do not believe we should have to submit data collected from animal studies before having a native herb listed on the ARTG.

Finally, one genuine reason for hastening slowly in the adaptation of Australian herbs into western herbalism is concern for the sustainability of the plant species and the intellectual property rights of our indigenous peoples. While these are real concerns for the future I don't believe they have had a significant influence up to this point in time.

3. COMMERCIAL EXPLOITATION OF INDIGENOUS HERBS

Australia has traditionally been slow to commercially exploit our native plant resources. There are numerous tales of how Australian plants have been overlooked locally, only to be successfully cultivated and processed into marketable products overseas. Examples include eucalyptus oil, macadamia nut, kelp (alginate production) and the kangaroo apples (*Solanum aviculare*, *S. laciniatum*) for solasidine – contraceptives, steroids - production. One major industry that has stayed in Australia is that of tea-tree oil production. While not wanting to place unnecessary impediments in the way of Australian enterprise, we need to beware of those who advocate exploitation of our plant resources for pharmaceutical and industrial purposes, especially where it involves biotech. processes such as genetic engineering and plant cell culture [Warren 1990].

While there has to date been only minimal interest in exploitation of indigenous herbs, there is much we can learn from experiences in other native plant based industries such as bush or native food and Australian wildflower industries. We have heard from Peter Hardwick about the number of native food plants with cross over medicinal applications, and we are fortunate to be able to 'tap-in' to the research that has already been conducted into sustainability and commercial cultivation of many native species.

4. ABORIGINAL INVOLVEMENT IN THE NATIVE HERB INDUSTRY

As we are all aware plants played a prominent role in Aboriginal life before colonisation, providing food, fuel, building materials and of course medicines. Anthropologists believe

plants were the source of up to 80% of the Aboriginal diet, though this figure would be far lower in the arid regions. We have much to learn from assessment of components of the Aboriginal diet. Carbohydrate sources such as Acacia seed contain fructans rather than starches, and these carbohydrates don't elevate blood sugar levels. Since adapting the "anglo" diet rich in starches and refined sugar the Aborigines have developed high incidences of diabetes, a disease that was previously unknown to them. The Aborigines also perfected complex detoxication procedures for otherwise toxic - even deadly - plants, which were processed so as to become not only edible but in some seasons performing the function of staple foods. Two examples are cycad fruits (*Macrozamia* spp.) and the Queensland black bean (*Castanospermum australe*).

It is a cliché to say the traditional knowledge is lost, although there must be a degree of truth in the assertion. As we have witnessed at this Conference custodians of traditional knowledge do exist, although they may be understandably reserved about sharing their knowledge freely. In many regions, such as the part of the Hunter Valley where I live, there are no indigenous people left while in other places I have lived most of the Aboriginal community have been displaced from their traditional lands and do not have a long association with that particular area. Some of the community elders still retain vast knowledge of plant use and traditional healing practices however, and I have been able to share some of my own plant knowledge with some of them.

Given the widely publicised health dilemmas amongst the Aboriginal population, the least non-Aboriginal healthcare professionals and researchers like many of us here can do is offer our knowledge and experience to treat and prevent sickness, in return for the knowledge of plant use and culture they have shared with us over the years.

5. ESSENTIAL OILS AND AROMATHERAPY

Australia is fortunate to have such a wealth of aromatic plants, and numerous species have been utilised for cosmetics and as aromatherapy oils. Health practitioners are able to use aromatherapy oils externally since the chemical components of essential oils are absorbed through the skin or the olfactory system (ie. the nose), thereby exerting a degree of therapeutic effect. Herbalists are in a unique position of having such a vast array of aromatic herbs to choose from, which we can utilise both as aromatherapy oils and as conventional herbal medications. One of the most promising uses is for the treatment of stubborn viruses and bacterial infections.

Essential oil production potentially inflicts a bigger impact on native flora than the regular medicinal herb industry. Given that essential oils comprise on average approximately 1% by weight of all plant constituents for aromatic plants, large volumes of plant material are required to produce commercial quantities of essential oils. For this reason the sustainability issues I am about to discuss are equally applicable if not more so compared to conventional herb production - though I should add any concerns I'm expressing here are theoretical - I'm not claiming to have any evidence.

6. SUSTAINABILITY OF SUPPLY OF NATIVE HERBS

The major threat to the survival of our indigenous plant species is undoubtedly land clearing. Natural ecosystems rich in biodiversity act as repositories for wild herbs. Old growth forests are absolute treasures when it comes to plant diversity. Our combined efforts should be directed towards opposition of land clearing in general and logging of old growth forests in particular.

More than 600 species of plants and animals in Tasmania are threatened, according to the Threatened Species Unit of the Parks and Wildlife Service. The Unit's strategy for conserving threatened species is to address 'key threatening processes' first and 'priority threatened species' second – a protocol they have found to be most efficient and cost effective. Six processes are identified as having the greatest impact - I'm sure these same processes may be regarded as the major threat to survival of vulnerable plant species throughout Australia. They are:

1. Clearance of native vegetation
2. Impact of pests, weeds and diseases
3. Degradation of water systems
4. Inappropriate use of fire
5. Inappropriate and illegal harvesting
6. Impacts of stock

On a national scale, a threatened flora database is maintained by the Centre for Plant Biodiversity, a jointly managed facility of Environment Australia and CSIRO Plant Industry. The Australian & New Zealand Environment and Conservation Council (ANZECC) also maintains a list of Threatened Australian Plants – including vulnerable, endangered and presumed extinct vascular plant species. ANZECC has also formed an Endangered Ecological Communities Network with provision for recognising and listing endangered ecological communities in legislation – this strategy is unique to Australia.

In the interests of conservation of native herb species I recommend individuals and companies involved in harvesting native herbs become acquainted with state and federal authorities and networks and the relevant legislation. We should also support groups such as Greening Australia who run regular training workshops in assessment and management of remnant bushland.

7. CASE STUDIES

See overheads

Dodonaea viscosa
Backhousia myrtifolia
Geijera parvilora
Melia azedarach
Scaevola spinescens

8. STANLEY NATIVE HERB PROJECT

The native herb project is being conducted from Stanley, a large pastoral farm on the Merriwa Plateau, in the outer reaches of the Hunter Valley. To date hundreds of native trees with medicinal uses have been planted as part of a larger revegetation scheme on the farm. Part of the farm is situated in the foothills of Coolah Tops and a few kilometres from the national park, and includes significant areas of remnant bushland and partially cleared pastures. Apart from the St John's wort that clothes the hillsides during summer, several medicinal herbs grow wild or are naturalised in the area.

The aim of the project is:

1. To increase our knowledge of indigenous medicinal herbs, and to help establish at least some species as reliable clinical agents
2. To restore native vegetation on farmland and enhance biodiversity
3. To establish a research and field study centre for use by students and herb enthusiasts.

The stages in the research project are as follows:

1. Vegetation survey of region
2. Maintenance of herbarium, preparation of voucher specimens.
3. Literature search
4. Selection of suitable species for project
5. Propagation and/or planting of species for cultivation
6. Ecological and sustainability studies – habitat documentation, biomass estimation, transect and quadrat methods (Dr.Liz Date ecologist)
7. Setup computer database
8. Harvesting of plant material, and subsequent drying or processing
9. Distillation for aromatic oils where appropriate
10. Organoleptic testing – taste, smell, feel etc.
11. Chromatographic analysis – TLC, GC
12. Manufacture of appropriate preparation – infusions, tinctures, ointments....
13. Personal use of preparations
14. Assessment of efficacy and safety, calculation of dose
15. *In vitro* studies
16. Adaptation to clinical context
17. Conduct clinical trials

9. EDUCATION and RESEARCH

There is a pressing need for educational institutions and the herb industry to combine forces to fund research into Australian medicinal plants. Some positive steps have been taken in this direction with the production of the Aboriginal Pharmacopoeia, which involved collaboration between the Aboriginal Communities of Arnhem Land, various government departments and universities. Apart from being a wonderful role model of what is possible, this project however had limited relevance in the southern states where the flora is quite distinct from that of Arnhem Land. In fact I find the majority of information written about native medicinal plants refers to tropical, sub-tropical and rainforest species. While these plants are of academic interest they do not satisfy the

knowledge needs of the majority of Australians who reside in the southern half of the continent.

I believe all medical herbalism courses throughout Australia should have an indigenous herbal topic in their curriculum. The herbal pioneer Denis Stewart has conducted such a course through his college for 15 years or so I have written and taught the subject for a similar length of time at various colleges. Even better if we could include traditional Aboriginal healers in the teaching of these courses.

10. NATIVE HERB FORUM

The Native Herb Forum was established about 18 months ago with the following objectives:

1. To positively influence the clinical use of Australian indigenous herbs.
2. To ensure ongoing supplies by exploring the potential of native herbs for cultivation.

Regular newsletters have been circulated to members of the Forum for free while data sheets and monographs are displayed on the website – the site generously donated by the NHAA and maintained by Michael Schubert. I have now decided to replace the newsletter with a more comprehensive publication called *Australian Wild Herb Bulletin*, to be available on subscription basis. Further information is available at the back of the room, and I invite you all to consider contributing or otherwise assisting in this publication – I hope it becomes the flagship for indigenous herbs in this country.

REFERENCES

- Aboriginal Community of the Northern Territory of Australia. 1988. *Traditional Bush Medicines*. Greenhouse Pubs. Melbourne.
- Bindon, P. 1996. *Useful Bush Plants*. Western Australian Museum, Perth.
- Brooker, S. Cambie, R. & Cooper, R. 1987. *New Zealand Medicinal Plants*. Reed, Auckland
- Collins, D.J. Culvenor, C.C.J. et.al. 1989. *Plants for Medicine*. CSIRO Australia
- Cowper, A.B. 1987. *Common Medicinal Plants of Australia*. Rose Print, Sydney.
- Cribb, A.B. & J.W. 1981. *Wild medicine in Australia*. Collins, Sydney.
- Everist, S.L. 1981. *Poisonous Plants of Australia*. Angus & Robertson, Sydney.
- Gott, B. & Conran, J. 1991. *Victorian Koorie Plants*. Yangennanock Women's Group, Hamilton Vic.
- Isaacs, J. 1987. *Bush Foods*. Weldons, Sydney.
- Kielczynski, V. 1997. Australian medicinal plants. *Medicinal Plants of the Southern Hemisphere Seminar*. Mediherb, Sydney.
- Lassak, E.V. & McCarthy, T. 1983. *Australian Medicinal Plants*. Methuen Australia.
- Levitt, D. 1981. *Plants and People. Aboriginal use of plants on Groote Eyelandt*. A.I.A.S. Canberra.
- Low, T. 1985. *Wild Herbs of Australia and New Zealand*. Angus & Robertson, Sydney.
- Low, T. 1991. *Wild Food Plants of Australia*. Angus & Robertson, Sydney.
- Leiper, G. Undated. *Mutooroo, Plant Use by Australian Aboriginal People*. Assembly Press, Australia.
- Maiden, J.H. 1889. *The Useful Native Plants of Australia*. Trubner. & Co. London.
- Parks and Wildlife Service Threatened Species Unit. Summary of threatened species strategy. <http://www.parks.tas.gov.au/publicat/tech/threatsp/summary.html>
- Penfold, A.R. & Willis, W.E. 1961. *The Eucalypts: Botany, Chemistry, Cultivation and Utilisation*. Leonard Hill, London.
- Warren, R. 1990. Australian plants are our neglected resource. *Australian Horticulture*. Feb.:28-32.
- Williams, C. Plants, poisons & survival in the rainforest. *Wellbeing Magazine* 70: 62-66.
- Wrigley, J. & Fagg, M. 1990. *Aromatic Plants*. Angus & Robertson, Sydney.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE
13 –14 August 1999.

CONFERENCE OUTCOMES, RESOLUTION

OUTCOMES – Statements and recommendations from 4 discussion groups

1. WILDCRAFTING and CONSERVATION

1. A code of ethics for wildcrafters.
2. Attempt to monitor the amount of wildcrafting in Australia.
3. There is a distinction between wildcrafting of native versus exotic species.
4. There are currently no major issues on native plants and wildcrafting but it could change in the future.
5. Raise awareness of conservation issues from by-products to practitioners.
6. More articles on plant conservation in the NHAA Journal.
7. Manufacturers are driven by demand – may consider preferential buying from wildcrafters adhering to specific code of practice.

2. INTELLECTUAL PROPERTY RIGHTS

1. There is a blending of kindred soles with plants in common
2. Australian aborigines do not have a fundamental agreement or treaty as does New Zealand
3. Fundamentally difficult dialogue between non-indigenous and indigenous people before they get to know each other. White people need to slow down and get to know the aboriginal people, before trying to negotiate business arrangements.
4. If a certain plant biotype is required that comes from a particular community, it is a matter of going to that community to negotiate.
5. Need to develop a model to set a precedent for other groups around the country.

3. CULTIVATION GROUP

1. The industry is market driven and cooperative networking is required
 - between growers, manufacturers, practitioners and retailers.
2. Identify lack of growers association and networking between herbalists, manufacturers and all the stake-holders. Models needed to develop co-operative network.
3. Most plants are imported – local growers are unable to satisfy local markets.
4. With regard to indigenous species, there is already expertise with growing native plants that may be accessed.
5. Need to identify funding sources for trial crops and horticultural research.
6. NHAA to incorporate indigenous and endangered species into curriculum.
7. Need for list of rare and endangered species to select potential crops.

MEDICINAL PLANTS FOR THE FUTURE CONFERENCE
13 -14 August 1999.

4. GENETICALLY MODIFIED ORGANISMS

1. This conference is opposed to genetic engineering of medicinal plants as being contrary to and not confirming with traditional usage.
2. This conference has no issue with genetic engineering when it is the result of traditional breeding methods.
3. We oppose the principle that plant breeder's rights over genetically improved plants can override the rights of those practicing traditional breeding methods.
4. Plant cloning in the medicinal herb industry may lead to loss of biodiversity and reduction of the gene pool.

RESOLUTION

Formation of new body or organization involving and funded by groups represented at this conference devoted to the conservation and sustainability of medicinal plants in Australia.

Andrew Pengelly Moved for the formation of a new working group funded by interested parties devoted to the conservation, sustainability and ethical production of medicinal plants in Australia.

Seconded Michael Schubert.

Passed. (2 abstentions)