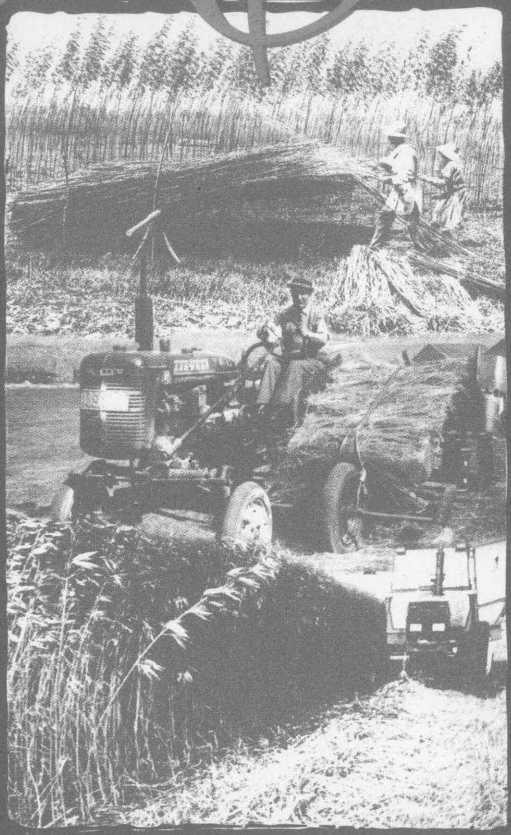
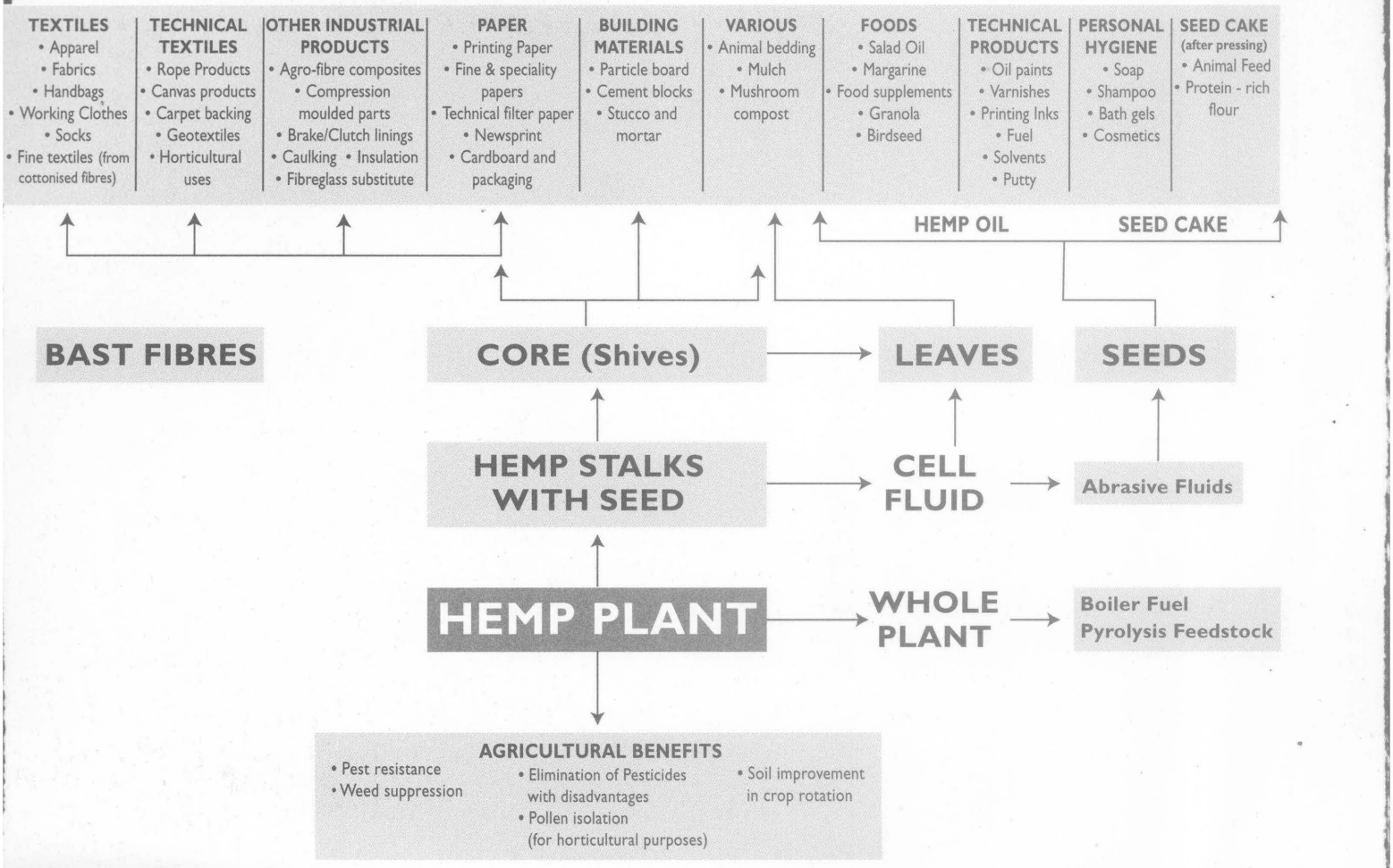
THE 5 MINUTE GUIDE TO

Industrial Hemp



IN NEW ZEALAND



Adapted from a version by Rural Industries Research & Development Corporation, ACT Australia

THE 5 MINUTE GUIDE TO

Industrial Hemp

IN NEW ZEALAND 1998

DISCLAIMER

The NZHIAI has to the best of its ability provided as up to date accurate information as its resources allow. The NZHIAI advises that it accepts no responsibility for the accuracy of the information supplied. The individual must accept responsibility for their own decisions. Before investing in Industrial Hemp the NZHIAI advises that first individuals or company's should satisfy themselves as to the accuracy and pertinence of applicable information.

PERSONAL APOLOGY/THANKS

To all those Hemp people who I have harassed, harangued, grovelled to, begged information, use of graphs, pictures or to confirm information in New Zealand & throughout the world, my heartfelt thanks. Special thanks to IHA, HIA, John McPartland, AHRM, Carolyn Ditchfield, Dave Cull, Doug Brown, White Buffalo Renewables, Kenex, Agrihill, Simon & David Musgrave, Candi Penn, Richard Barge, Thomas Brown and many others. My thanks for your patience and tolerance; this booklet simply wouldn't have happened without your forbearance and support.
We have tried to credit as well as we were able, apologies to any we have wrong.

D J (MAC) M'INTOSH
SUNDAY, FEBRUARY 15, 1998

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CONTENTS

The "5 minute Guide" to Industrial Hemp in New Zealand came about due to politicians, farmers, investors, government agencies and others asking for documentation specifically with a New Zealand slant regarding Industrial Hemp. It has been produced after two years and many abortive attempts with the best information available to the writers at the time; it is by no means complete. Rather it is slightly more than the 5 Minute blurb you give someone, fairly unfamiliar with Industrial Hemp, when you first meet. Future editions will be more comprehensive. It is further worthy of noting that it has been produced with extremely limited resources in terms of financial backing. Really it's the sort of publication that the Ministry of Agriculture, which has the resources, could have produced for their rural clients. The preceding is not a criticism of MAF however as this particular subject for all the wrong reasons has been dumped on the Ministry of Health's desk. In the writer's opinion this is somewhat of a comic tragedy, as the MOH staff are rightfully more concerned with health issues. The subject matter, Industrial Hemp, is way beyond that Ministry's area of expertise, again that is no criticism of the MOH who have done a reasonable job fronting for the politicians. NZ bureaucracy appears to have little real knowledge of the Global Industrial Hemp renaissance. It is hoped that this first edition will be part of an ongoing annual peruse of the current state of Industrial Hemp in NZ, but also informative regarding latest international developments, methodology, harvesting, manufacturing techniques & equipment including results of research and development.

The NZHIAI believes it won't be too long before we are writing regarding innovations in Industrial Hemp that New Zealanders are involved in or responsible for. We hope we can foster positive business relationships with Australia & the rest of the world. We also believe that whilst centralisation may be financially prudent for major businesses it does little for a comfortable society. In effect Industrial Hemp is a step backwards in that it decentralises due to the fact that it is a bulky raw material and some processing at least must take place close to the harvested crop. This has the effect of vitalising communities all the way through the process.

Industrial Hemp may not save the world but it will certainly give the citizens of the planet a significantly better environment and way of life. NZHIAI is firmly of the belief that Industrial Hemp WILL completely change the way we do business in New Zealand, create tens of thousands of sustainable jobs, foster international relationships and business ventures, enhance the environment and environmental consciousness in society, whilst significantly, over time, enhancing the lives of communities.

Industrial Hemp is a vigorous, versatile, renewable on an annual basis, environmentally friendly crop. It has the advantage also of being a multi purpose crop. Innovative companies have produced plastics, detergents, clothing, paper, beer & burgers from Industrial Hemp, an estimated 25,000+ products worldwide.

At the end of the booklet you will find the contact addresses of NZ organisations involved with Industrial hemp. Also International organisations & contact details.

We also briefly outline the Top Industrial Hemp Publications & give our view of their current relevance and value to you with details of how to obtain if you wish.

We hope this booklet leaves you better informed & supportive of Industrial Hemp.

Astute readers will recognise that much of this booklet is opinion. It should be noted that whilst this is an accurate assessment it is based on 14+ years of accumulative involvement in the International Industrial Hemp community by the writers, the many informative contacts obtained through that medium and the most up to date information available at the time of writing. No doubt the reader will formulate their own view as to the accuracy of our opinions or otherwise.

D J (MAC) M^cINTOSH 1998. THIS BOOKLET WAS COMPILED BY D J (MAC) M^cINTOSH, RICHARD BARGE & THOMAS BROWN WITH THE HELP OF MANY OF THE INTERNATIONAL HEMP COMMUNITY.

NEW ZEALAND HEMP INDUSTRIES ASSOCIATION INCORPORATED 1996

Why is the New Zealand Hemp Industries Assn. Inc so supportive of the re-introduction of Industrial Hemp to New Zealand?

Because New Zealand is an economy dependant on primary produce, farmers throughout New Zealand but mainly in the South Island have been expressing their despair regarding present farming viability to NZHIAI for over four years.

- Rural New Zealand needs revitalisation by some form of land use that is versatile & profitable.
- Hemp is a versatile environmentally friendly, sustainable, renewable crop well suited to New Zealand's innovative farmers, soil & climatic conditions.
- Rural New Zealanders who know about Hemp want its viability tested.
- Rural New Zealand, unlike corporate New Zealand, needs widespread processing & manufacturing facilities to stop rural townships from slowly but surely dying through centralisation & lack of employment.
- Demonstrably Industrial Hemp fulfils these criteria.
- Rural New Zealand requires investment capital to survive; Industrial Hemp with its multitude of end uses provides many unique investment opportunities.
- The will is already present on a small scale in Rural New Zealand.
- The downstream effects of a healthy rural economy benefit all New Zealand, including the government, which would get a tax take all through the process.
- Funding the development of Industrial Hemp & the necessary manufacturing & processing infrastructure, whilst not easy or a foregone conclusion, already has interested offshore investors.

- New Zealand is unlikely to be able to compete with China regarding textiles but there are so many other possibilities that this is not an inhibiting factor.

- To date lack of government interest to some extent combined with bureaucratic misinformation has held the development of Industrial Hemp back in New Zealand.

- The NZHIAI has formed a syndicate called HEMPSEED HOLDINGS Ltd. With the view to being granted a license to produce Hemp cultivars specifically able to withstand New Zealand's diurnal temperature fluctuations & suitable for New Zealand soil, climate & end usage applications.

NZHIAI EXECUTIVE DECEMBER 1997

COURSTEY OF KENEX LTD, CANADA

Chapter 1

GLOBAL

All the available literature leads the writer to believe that Hemp can and should be described to a large extent as the fibre which supported the cradle of civilisation.

A stone age village unearthed on the island of Taiwan over 10,000 years old, contains the earliest evidence of Hemp to date.

Although the Chinese were probably the first to domesticate and use hemp extensively, the most noted euphoric users were the Hindu's and Scythians. The Atharva-Veda (1400 BC) refers to its usage. The Scythians, who roamed the Asian continent and ruled ancient Russia during the days of the Greeks, used Hemp for utilitarian & euphoric purposes. They were among the finest craftspeople, artists and warriors the world has ever known. (Jack Frazier/The Great American Hemp Industry)

China appears to have the longest continuous history of Hemp cultivation (over 6000 years) interestingly they are also attributed with having invented paper. France has cultivated Hemp for at least 700 years to the present day, Spain and Chile similarly. Russia was a major grower/supplier for hundreds of years.

THE SOUTHERN COLONIES

It is difficult if not impossible to ascertain when Hemp first appeared in New Zealand, but without doubt it was part of Able Tasman's ship's inventory. It is unclear if any seeds were traded or left with the Natives of New Zealand at the time, but is likely though unconfirmed. Captain James Cook certainly had hempseed on board Endeavour but no records exist concerning whether it was planted or traded anywhere in New Zealand.

In the late 1770's Sir Joseph Banks & Admiral Sir George Young were enamoured with the concept of creating colonies in the southern islands (Australia & New Zealand) on the basis of reducing the British Empires dependence on Russian Hemp.

Britain's seapower was based on adequate supplies of both timber & hemp.

To outfit a naval vessel of the day required 80 tons of Hemp per ship. This equates to approximately 350 acres of hemp to produce a complete ship's outfitting, refits of all hempen components took place every 3 to 4 years.

The French were also dependant on Russian Hemp and in 1785 sent Le Prouse on an expedition with instructions to bring back samples of New Zealand HEMP *flax phormium tenax* which was prized by the British.

1778 - 1820's saw much interest & instructions from Britain including the King to the colonies to supply Britain with both New Zealand Hemp *phormium tenax* and traditional Hemp *Cannabis Sativa L.*

Those wishing to suppress uncomfortable truths regarding Hemp have managed to date to suppress the most uncomfortable truth of all, that is:

New Zealand & Australian colonies began, at least in part and intent as Hemp colonies!

In 1892 hempseed imported to the colonies was distributed to over 600 farmers in Australia and to a lesser extent, New Zealand. For reasons that remain unclear Hemp did not become a major part of the colonies' development, however some of the evidence remains. Such as the 1960's Australian Hunter Valley discoveries of huge wild tracts of *Cannabis Sativa L* (Hemp).

There were abortive attempts to start a Hemp colony on Norfolk Island during most of the 1800's.

The Southern Colonies (cont...)

Mother Aubert grew Hemp at Jerusalem (near Wanganui) as part of her pharmacopoeia from 1883 on. Anecdotal reports suggest that Industrial Hemp was grown in most parts of New Zealand including Ruapuke Island in Foveaux Strait. (Below 45 south with what could be described as an inhospitable climate)

Until the introduction of the DANGEROUS DRUGS & POISONS REGULATIONS 1927 chemists could sell Indian Hemp to anyone in New Zealand.

Gazetted in 1928 Indian Hemp was included simply to control the importation for pharmacopoeia, no other controls or taxes were imposed at this time.

In 1941 the Dept. of Scientific & Industrial Research (DSIR) grew 1 hectare of Hungarian Hemp in the central North Island.

Shortly thereafter Ministry of Agriculture & Fisheries (MAF) trialed 4hectares near Foxton & reported. "It grew magnificently & fibre yield was excellent". (Today MAF are unable or unwilling to provide any information regarding these trials, the trials were at the urgings of the United States government.)

Trials stopped abruptly in 1948 when they were told that it was Indian Hemp from which hashish was made.

The law was changed after the acquittal of an Aro St truck driver on cannabis possession charges in 1960 when the magistrate discovered there was nothing in the 1927 Dangerous Drugs & Poisons Regulations that made it an offence to possess or cultivate drugs with the exception of Opium.

Within several months an order in council changed that, making it illegal to possess or cultivate cannabis. It also outlawed hempseed in birdfeed & veterinary supplies.

This became part of the Misuse of Drugs Act 1961, now Misuse of Drugs Act 1975.

Effectively Cannabis possession & cultivation was not legally outlawed until 1961. (Coincidentally the same year the USA pushed the UN Single Convention on Narcotic Drugs 1961 through.)

It would only require an order in council to facilitate Industrial Hemp production & it still leaves the question of section 28.2 UN Single Convention on Narcotic Drugs 1961 (interestingly the first words of which are: "Concerned with the health and welfare of mankind") which states:

"This convention shall not apply to the cultivation of the cannabis plant exclusively for industrial purposes (fibre and seed) or horticultural purposes".

To which New Zealand is a signatory.

THE WRITER BELIEVES THAT IT IS NOT ILLEGAL TO CULTIVATE INDUSTRIAL HEMP IN NEW ZEALAND.

THE GLOBAL RENAISSANCE OF INDUSTRIAL HEMP

About 1990 there were limited news media items and some publications began running small stories of Industrial Hemp's renaissance throughout the western world.

There were isolated people interested in the possibilities of Industrial Hemp applications in New Zealand farming / manufacture and economy overall. As a broad statement their motivation more often than not was environmental in its philosophical base. It appears likely that these early-interested parties were not afraid of the association with marihuana, it is possible they were introduced to Industrial Hemp via that medium.

The global renaissance of Industrial Hemp was gaining momentum. Surprisingly, given the nation's almost complete dependence on primary produce, New Zealand wasn't even on the bus.

HEMP PRODUCTS ARRIVE IN NZ

A number of Hemp products businesses began to appear during the early to mid 90's possibly the most notable being the HEMP TRADING COMPANY, based in Auckland, focusing in the main on textiles, and the HEMPORIUM in the capital Wellington, a hemp products retail outlet. Bryan Slight one of the few visionaries was attempting to excite people and businesses around Tauranga and did inspire a few to produce Shampoos and New Zealand Wool & Hemp were combined to make woollen products such as socks and jerseys by HEMPNITZ. By 1997 there were at least 15 'purist' Hemp companies registered in New Zealand and a large number of businesses having some Hemp products available as part of their inventory albeit often in a sporadic manner which possibly reflects the ability of overseas manufacturers and suppliers to meet demand.

There was a significant increase in Rural New Zealand interest in Industrial Hemp during 1996 & 1997, culminating in late 1997 with the first small business development grant to a Motueka group to investigate the job opportunity and economic viability of Industrial Hemp for the region.

FACT OR FICTION?

There are anecdotal reports that Industrial Hemp has been grown recently around the Gisborne area, but inquiries to government agencies has provided no confirmation of this and it is difficult to believe it could be done without coming to the attention of both the authorities and the media. Possibly this was wishful thinking on behalf of some?

NEW ZEALAND HEMP INDUSTRIES ASSOCIATION INC.

Predictably the areas showing the most interest regarding Industrial Hemp in New Zealand are also the areas with the most severely depressed rural economies, i.e. Southland, Motueka / Tasman, Canterbury, Northland and Hawkes Bay. As a concept the NZHIAI started in 1990 and operated on an informal basis from 1994. The NZHIAI became an incorporated society in 1997. In 1998 the NZHIAI is at the forefront of information distribution, licencing applications and is politically proactive.

The NZHIAI believes that Industrial Hemp has the proven ability to completely revitalise New Zealand's ailing rural economy, create tens of thousands of sustainable jobs, provide an invaluable renewable resource and reverse the increasing environmental damage the nation is experiencing, and also reverse the drift from rural New Zealand to the cities thus losing forever real knowledge and understanding of the skills and lifestyles associated with primary production..

A question mark that keeps on arising from some politicians in 1997 is the economic dependence in their electorates on illegal cannabis crops, our response is why not transfer that dependence to a legal crop i.e. Industrial Hemp.

New Zealand a nation dependant on primary produce, is allowing Australia to lead the way regarding Industrial Hemp in this area of the Pacific. The NZHIAI is of the view that we do so at our peril!

Industrial Hemp will only become an economic and agricultural reality in New Zealand if there is a strong Rural demand for it.

Fortunately from our perspective this is already occurring in a small way. It needs to be built upon to succeed.

At the end of the day the primary producers will decide.

RESPECTABILITY IN 1997 FOR INDUSTRIAL HEMP

In early 97 the Musgrave family of Waihi bush, Geraldine, who are reintroducing Flax to the New Zealand agricultural scene, (David Musgrave was also Vice Chairman of the bio gro council, and have the only cold pressing for seed oil plant in New Zealand,) joined the NZHIAI as they could see it complemented their operation and appeared to be in line with their personal philosophies.

Ernest New of Ernest New Associates, a consultancy firm in Invercargill is also very pro Hemp and a NZHIAI member (Ernest is moderately famous in New Zealand for his nut farm located at Queenstown on the shores of Lake Wakatipu. He also advises councils on a multitude of issues.) Ernest is our oldest member well into his 60's and one of the more interesting human beings one could hope to meet.

The Motueka Employment and Small Business Centre received the only New Zealand grant to date to assess the economic and employment opportunities Industrial Hemp may offer the district.

There were a number of positive press articles and the Minister of Health finally tabled its recommendations (1) to the Minister regarding the licencing of Industrial Hemp. Increasing numbers of farmers are inquiring re Industrial Hemp and approaches have been made for research funding in Southland, Canterbury, Tasman and Hawkes Bay.

Thirteen MP's responded positively to a NZHIAI Industrial Hemp survey, as have some Mayors. In late 1997 The New Zealand FARMER ran a very positive article by an NZHIAI member Caroline Adams.

(1) EXTRACTED FROM THE MOH REPORT SEE PAGE 14

MINISTRY OF HEALTH 1997 REPORT

Commercial Cultivation of Cannabis Sativa for Production of Industrial Hemp

LEGISLATIVE AND SECURITY ASPECTS OF RECENT AUSTRALIAN TRIALS

DR G R BOYD CHIEF ADVISOR REGULATION AND SAFETY
MINISTRY OF HEALTH NEW ZEALAND SEPTEMBER 1997

RECOMMENDATIONS

- The moratorium on considering applications to commercially cultivate cannabis should be lifted to allow trial plots for research purposes.
- A working party should be established to consider and recommend to the Director General of Health the criteria to be used in considering applications for licenses to cultivate cannabis plants, the degrees of control and audit and testing required, the conditions to be attached to any such licenses, and the controls needed for other consequential licenses required for importing, dealing in and possessing cannabis seeds and plant material.
- *The working party should comprise representatives of:*
  - NZ Police
  - Customs Department
  - Ministry of Agriculture
  - Ministry of Health
  - Federated Farmers
  - **NZ Hemp Industries Association Inc.**

THE FUTURE OR INEVITABILITY!

Opinion

The introduction of Industrial Hemp to the New Zealand rural scene and economy appears inevitable, particularly as 33 countries are already growing it including dear old mother England (6000 acres, 1997.) So, it is no longer possible to dismiss Industrial Hemp as some aging hippie's dream scheme.

However what is by no means certain is just where industrial hemp may fit within New Zealand's economy or what investment and Research and Development dollars it can attract. The international recognition of the economic benefits of industrial hemp, and New Zealands track record of innovation in the primary produce sector means we are well placed to become world leaders in this emerging industry. The preceding coupled with the precedent set by funding for the Motueka research means that Government funding is a real possibility. At this stage all that can be said is that the signs are increasingly positive, if frustrating.

DJ (MAC) MCINTOSH
FRIDAY, MARCH 27, 1998

TODAY'S HEMP INDUSTRY

A brief profile of 24 of the 33 countries currently growing Industrial Hemp

AUSTRALIA allows research crops. And in Victoria, Australia commercial production is now licensed.

AUSTRIA has a hemp industry including production of hempseed oil, medicinals and Hanf magazine.

CANADA started to license research crops in 1994 on an experimental basis. In addition to crops for fibre, one seed crop was experimentally licensed in 1995. Many acres were planted in 1997. Canada now licenses for commercial agriculture with thousands of acres planned for 1998.

CHILE grows hemp mostly for seed oil production.

CHINA is the largest exporter of hemp paper and textiles.

DENMARK planted its first modern hemp trials in 1997. Committed to utilising organic methods.

FINLAND has had a resurgence of hemp *(hampu)* beginning in 1995 with several small test plots.

FRANCE harvested 10,000 tons in 1994. France is the main source of viable low-thc hempseed.

GERMANY only banned hemp *(hanf)* in 1982, but research began in 1992 and many technologies and products are being developed. Clothes and paper are being made from imported raw materials. Germany lifted the ban on growing hemp November, 1995.

GREAT BRITAIN lifted hemp prohibition in 1993. Animal bedding, paper and textiles have been developed. A government grant was given to develop new markets for natural fibres. 4,000 acres were grown in 1994. Subsidies of £230 Eng. pounds per acre are given by the govt. for growing.

HUNGARY is rebuilding their hemp industry, and is one of the biggest exporters of hemp cordage, rugs and hemp fabric to the U.S. They also export hemp seed and hemp paper.

INDIA has large stands of naturalised Cannabis and uses it for cordage, textiles, and seed oil.

JAPAN has a religious tradition which requires that the Emperor wear hemp garments, so there is a small plot maintained for the imperial family only. They continue to import for cloth and artistic applications.

TODAY'S HEMP INDUSTRY

NETHERLANDS is conducting a four year study to evaluate and test hemp for paper, and is developing processing equipment. Seed breeders are developing new strains of low-thc varieties.

POLAND currently grows hemp for fabric and cordage and manufactures hemp particle board. They have demonstrated the benefits of using hemp to cleanse soils contaminated by heavy metals.

ROMANIA is the largest commercial producer of hemp in Europe. Total acreage in 1993 was 40,000 acres. Some of it is exported to Hungary for processing. They also export to Western Europe and the United States.

RUSSIA maintains the largest hemp germ plasm collection in the world at the N.I. Vavilov Scientific Research Institute of Plant Industry (VIR) in Saint Petersburg. They are in need of funds.

SLOVENIA grows hemp and manufactures currency paper.

SPAIN grows and exports hemp *(caamo)* pulp for paper and produces rope and textiles.

SWITZERLAND is a producer of hemp.

EGYPT, PORTUGAL, THAILAND and the **UKRAINE** also produce hemp.

THE UNITED STATES has not granted any hemp permits in 40 years. Importers and manufacturers have thrived using imported raw materials.

SUPPLIED BY CANDI PENN, HEMP INDUSTRIES ASSOCIATION (HIA) USA.

OPEN DAY AT KENEX LTD, CANADA

Chapter 2

HEMP FACTS

- **Hemp** grows to maturity in 100 days, is ideal in rotation and conditions the soil for future crops with its long root system. It can provide 3-10 times the return of other common land uses in New Zealand as the Canadians and Australians are currently proving.
- **Hemp** requires little if any pesticides, herbicides and fungicides.
- **Hemp** cultivation has been documented as being able to lift heavy metals from polluted soil (as seen in Eastern Europe)
- **Hemp** is a compatible raw material for many industries due to its production of three raw materials, bast fibre, the hurd and the seed.
- **Hemp** Seed is nature's perfect food source, thanks to a perfect balance of essential fatty acids, protein and carbohydrates. You could eat only hemp seed and never be deficient in your daily dietary requirements
- **Hemp** seed oil can be used for human consumption or as high quality industrial oil; the by-product from the pressing process is a seedmeal, which is virtually pure protein, ideal as a human or stock food source.
- **Hemp** fibre textiles, naturally stops up to 95% of the sun's harmful UV light, while being 5 times as strong as cotton; coupled with strong anti-fungal, antibacterial properties makes the fabric a natural choice for hospitals and surgical applications.
- **Hemp** paper is of superior strength, and folding endurance, which will outlast wood pulp paper by a factor of ten. Hemp on an annual basis produces more pulp per acre than trees with considerably less risk involved.
- **Hemp** construction materials are available, with entire sub-divisions being built in France utilising hemp as a concrete substitute, an alternative to wood fibreboards and for structural reinforcement and support beams.
- The **Hemp** Hurd being largely cellulose can and is producing biodegradable plastics.
- **Hemp** Biomass fuel produces no sulphur and can be effectively used as a relatively clean power source due to its 95% fuel to feed ratio.
- Worldwide consumer demand for Eco **Hemp** products has been growing at over 100% per annum since 1990.
- **Hemp** was historically the World's food and fibre source until the 1930's, including a wide range of medicinal applications, which are now being proven by clinical study.

WHY HEMP FOR NEW ZEALAND AND WHY NOW?

Hemp could go a long way toward solving some of New Zealand's problems, such as:

- Soil degradation.
- Weed control.
- Pollution from agricultural chemicals.
- Pollution from unsound industrial and agricultural chemical use.
- Deforestation.
- Depletion of non-renewable energy resources.
- Exodus from the family farm.

INDUSTRIAL HEMP CAN:

- Revitalise the rural economy due to the downstream processing.
- Remove dependence in some areas on illegal Cannabis crops & transfer that dependence to legal Industrial Hemp crops.
- Create healthier citizens through the availability of nature's most nutritionally complete source of easily digestible EFA's. (Essential Fatty Acids - foodstuffs)
- Provide some inspiration for hard pressed primary producers.

FACTS ABOUT HEMP SEED OIL

The worlds most nutritionally
Complete Food Source

HEMP SEED & HEMP SEED-OIL HAVE THE FOLLOWING UNIQUE PROPERTIES:

- Used as a food, cosmetic and medicine by humans since the beginning of recorded history,
- Oil comprises 35% total seed weight.
- Oil is 80% by volume essential fatty acids (EFA's)
- 55% LA (Omega 6) 25% LNA (Omega 3) 1.7% GLA (Super Omega 6)
- EFA's cannot be produced by the body & govern growth vitality & state of mind, anti viral & anti bacterial properties.
- Removes plaque & cholesterol from veins & arteries.
- EFA's are fats that make you thin. (good healthy necessary fats)
- 1 pint contains 1000 I U of vitamin E, (healthy skin.)
- EFA's are responsible for our immune responses.
- Hemp Seed-Oil (EFA's) promotes lustrous Hair, Skin & Nail growth.
- Hemp Seed-Oil induces over time smooth unblemished, satiny feeling skin (healthy).
- The Chinese believe Hemp Seed-Oil used regularly prevents old age & keeps skin toned & firm.
- HempSeed & Oil are devoid of psychoactive properties.
- Penetrates cells better than any other natural oils. -
- Skin softening properties.
- Stimulates hair growth.
- Nature's best, perfectly balanced oil for Human Health.
- 24% protein, a handful of seeds per day provide min daily requirement,
- Coconut oils etc only coat skin/hair, Hemp Seed-Oil penetrates.

HEMP SEED OIL'S ESSENTIAL FATTY ACID PROFILE

Omega-3	19%
Omega-6	57%
Omega-9	12%
GLA	2%
Stearic	2%
Palmatic	6%
Other	2%

ANDREW WEIL, MD,
ARTICLE ON HEMP SEED OIL

ANALYSIS OF HEMP SEEDS

U.S.R.D.A. RESULTS

MOISTURE	5.7%	
FAT	30%	
PROTEIN	22.5%	
ASH	5.9%	
ENERGY	503 Calories/100g	
CARBOHYDRATES	35.8%	
CAROTENE(VITA)	16,800 IU/lb	5000 IU/Day.
THIAMINE(B1)	0.9mg/100g	1.2mg/Day.
RIBOFLAVIN(B2)	1.1mg/100g	1.7mg/Day.
PYRIDOXINE(B6)	0.3mig/100g	2.0mg/Day.
NIACIN(B3)	2.5mg/100g	20mg/Day.
VITAMIN C	1.4mg/100g	60mg/Day.
VITAMIN D	10 IU/100g	400 IU/Day.
VITAMIN E	3mg/100g	30 IU/Day.
INSOLUBLE DIETARY FIBRE.	32.1%	
SOLUBLE DIETARY FIBRE.	3.0%	
TOTAL DIETARY FIBRE.	35.1%.	

SOURCE: DON WIRTSHAFTER, OHIO HEMPERY.

Humans need more EFA's than any other vitamin. Unfortunately, EFA's have been designed out of modern processed foods to extend shelf life. This is why to maximise its beneficial attributes Hemp seed oil must be cold pressed in the absence of light and oxygen. A single photon of light can quickly alter 30,000 molecules of Hemp Seed oil. It goes off readily when exposed to light & air & can be quite harmful if taken spoiled.

REFERENCES: ANDREW WEIL. MD. (HEMP OIL) UDO ERASMUS. (FATS THAT HEAL, FATS THAT KILL) NUTRITIONAL & MEDICINAL GUIDE TO HEMP SEED. & MANY OTHERS.

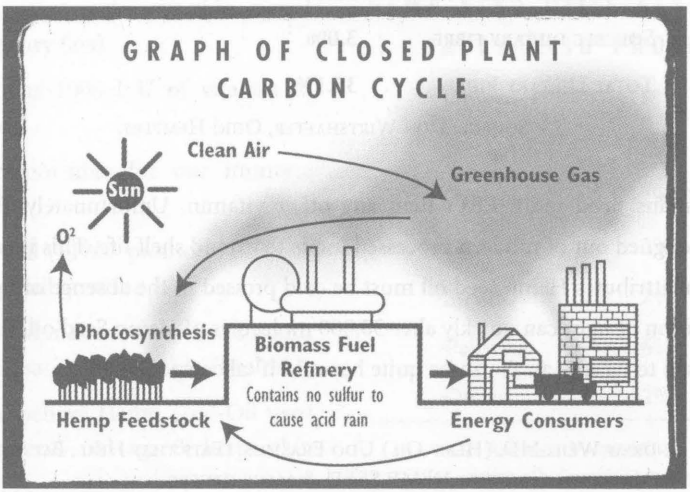
HEMP WILL SAVE THE WORLD!

Some Industrial Hemp advocates righteously claim that Hemp will save the world, they are well meaning but seriously misguided, no single person entity or plant in isolation can possibly rectify the damage that man has inflicted on his environment.

The NZHIAI believes this to be an indisputable fact supported by a myriad of scientific data.

In 150 or so, years since the Industrial Revolution we have released carbon, carbon dioxide & other nasties BACK into our atmosphere, these same took nature 100's of millions of years to remove from the earth's atmosphere & thus give us the climatic conditions we currently enjoy. It was a long slow process. It is inconceivable that future generations, 20- 50- 5,000 years hence will not pay the price for that folly. Still we dither around bound by our personal lifecycle; our thinking seldom goes beyond our immediate surroundings and life span. Hemp itself may not 'save' the earth's environment, as human beings 'like' it, but, the change in attitudes from a petrochemical (hydrocarbons) based world economy, to a closed, self perpetuating environmentally sensitive plant based (carbohydrate) economy such as Henry Ford envisioned whilst growing HEMP in 1941, quite probably will.

"Anything that can be made from Hydrocarbons, can be made from carbohydrates". HENRY FORD. 1941



Chapter 3

PRODUCING INDUSTRIAL HEMP

A few fallacies regarding growing Industrial Hemp should be clarified at this time.

GROWING

Many countries around the world currently grow Industrial Hemp, (33 at time of writing.) These include those who have continually grown hemp such as China, France, India, Rumania, Hungry, North Korea, Ukraine and Russia, while other countries have only recently begun researching a hemp Industry,

These include England (1993), Holland, Germany (1995), Canada (1994), Australia (1990), (dates shown indicate years in which these countries began their trials).

Hemp is an ideal rotation crop helping to break up and condition the soil for following crops due to its long root structure penetrating 2 meters into the soil when fully matured, this helps aerate the soil.

Significant amounts of heavy metals have been removed from polluted ground by hemp crops in Poland and other Eastern European countries.

COURTESY OF BIOREGIONAL DEVELOPMENT GROUP, SUTTON ECOLOGY CENTRE, UK

HEMP REQUIRES NO FERTILISER?

Whilst it is true that HEMP is grown in small plots in so called under-developed countries with no fertiliser, often in poor soils, with meaningful results, the reality is that Hemp (Cannabis Sativa L) is not a nitrogen fixer, and to produce on the scale necessary to make it an economically viable crop in the modern world Hemp requires finely tilthed soils, rich in organic matter.

Industrial Hemp requires nitrogen, phosphorous & potassium to produce maximum economic returns. Of course all these facts are gross generalisations. Specifically developed genotypes have been produced in Russia and Hungary that require minimal or no fertiliser. The real facts appear to be if you farm it you have to look after it & its home i.e. the soil.

"Hemp seems to be an attractive crop for a sustainable agricultural system, as it has moderate fertiliser requirements, needs little or no pesticides and suppresses weeds and some major soil-borne pathogens.

Cannabis is certainly a valuable crop plant, and its future success will depend in part on the responsible dissemination of accurate information concerning its benefits."

HAYO M.G. VAN DER WERF
Journals International Hemp Association.
Author 1994 Crop Physiology of Fibre Hemp (Cannabis Sativa L.)
Doctoral thesis.

NUTRITION

To achieve an optimum hemp yield, twice as much nutrient must be available to the crop as will finally be removed from the soil at harvest.

A hemp field produces a very large bulk of plant material in a short vegetative period. The nitrogen uptake is most intensive the first 6 to 8 weeks, while potassium and in particular phosphorous are needed more during flowering and seed formation. Industrial hemp requires 105 to 130 lbs/ac (120 to 150 kg/ha) nitrogen, 45 to 70 lbs/ac (50 to 80 kg/ha) phosphate and 52 to 70 lbs/ac (60 to 80 kg/ha) potash.

COURTESY OF: DOUG BROWN , WHITE BUFFALO RENEWABLES, CANADA

HEMP WILL GROW ALMOST ANYWHERE

The Cultivar Question?

Well of course it will, but will it produce economically viable, usable & uniform raw materials, would be a more pertinent question. Hemp is grown in mountainous regions of Morocco & is a viable agricultural crop there. The biodiversity question as it relates to Industrial Hemp seedstock is further compounded by western bureaucracies insisting on no more than 0.3% THC (tetrahydrocannabinol), the psychoactive ingredient of Marijuana, content in the mature plant. The European Union has only approved 12 cultivars to date (approximately 600 germ plasms are held at the Valisov Institute), the majority of which are French, which is no surprise as they have been growing Industrial Hemp nonstop for hundreds of years. This of course gave the French a virtual monopoly on Industrial Hemp seedstock until very recently. At least two issues are currently confronting this situation; the Swiss, tired of this artificial monopoly, implemented a policy whereby provided you signed a statutory declaration stating that you would only utilise the crop for industrial purposes, you could grow whatever Hemp cultivar you liked. This has been a boon to Swiss farmers, who are enjoying increased Industrial Hemp production.

The second issue is in the European Union, Australia, England & Canada, Industrial Hemp farmers & researchers are pushing for a more realistic figure of 1 to 1.5% THC content in the mature plant. Given that the authorities generally recognise that for Marijuana to have any effect on human beings it must have 3-18% THC content, this proposal seems imminently logical. Another problem faced by embryonic Industrial Hemp producers/farmers is the high cost of approved cultivar seedstock, in general terms it is possible to purchase Industrial Hemp seedstock for as low as USD$500 per tonne, but realistically it costs about USD$2500 per tonne at the time of writing, combine this with two other factors, high cost of transportation & a requirement to harvest the crop (Australia/Canada) prior to seed formation, means that farmers in New Zealand/Canada/Australia, under those conditions will NEVER have acclimatised (generally recognised as 3- 4 generations) seedstock nor genotypes bred for specific product end usage requirements in their particular geographic location. This has very dramatic effects on the economic models produced by these TRIAL crops. An Industrial Hemp trial crop from seedstock not acclimatised will never give a representative picture of the crops economic potential. The real value of trial crops realistically should be to produce cultivars suitable for local conditions.

CONT... PG 27

HEMP WILL GROW ALMOST ANYWHERE Cont...

We are talking optimum performance of known commercial cultivars here. As there is no acclimatised seedstock specifically designed for New Zealand soil types, trial crops will really only set a precedent to allow politicians & bureaucracy to become comfortable with their legislative requirements & add an onerous but unavoidable cost to early participants.

Industrial hemp is sensitive to soil compaction and waterlogged soil conditions.

The NZHIAI has a sub project specifically designed to produce cultivars for New Zealand climatic & soil conditions called, HEMPSEED HOLDINGS Ltd.

HEMP - SOIL TEMPERATURE & WATER

Hemp should not be planted until soil temperatures reach at least 6- 8°C, in the first month or so. The seedlings require 3-4 inches of rain or irrigation, during this first month of growth, 25-30 inches rainfall per annum. As they grow larger these requirements drop dramatically due to the dense canopy enabling water retention and the deep taproot seeking out the water table. Industrial Hemp is frost tolerant. Hemp tolerates temperature extremes. In the drier regions of New Zealand suitable for growing Industrial Hemp such as Canterbury, Tasman & Hawkes Bay it is highly likely that irrigation would be necessary.

HEMP HAS NO PESTS OR DISEASES?

The International Hemp Association has published a two-part review identifying over 300 insect pests.

JOHN MCPARTLAND WROTE: *"Cannabis has a reputation for being pest free. Actually, it is pest tolerant. Most Cannabis pests are insects. Nearly three hundred insect pests have been described on Hemp & Marijuana, but very few cause economic crop losses".*

COMMON CANNABIS PESTS

SEED AND SEEDLING	FLOWER AND LEAF: OUTDOORS	FLOWER AND LEAF: INDOORS	STALK AND STEM	ROOT
cutworms	hemp flea beetles	spider mites	European corn borer	hemp flea beetles
birds	hemp borer	aphids	hemp borer	root maggots
hemp flea beetles	budworms	whiteflies	weevils	termites and ants
crickets	leaf miners	leafhoppers	modellid grubs	fungus gnats
slugs	green stink bugs		longhorn grubs	wireworms
rodents				

SOURCE: *Journal of the International Hemp Association* 3, no. 2 (1996)

FURTHER ON HE STATES: *"The claim that Cannabis has no diseases is not correct. Cannabis suffers over one hundred diseases, but less than a dozen are serious".*

COMMON CANNABIS DISEASES

SEEDLING DISEASES	FLOWER AND LEAF DISEASES (outdoors)	FLOWER AND LEAF DISEASES (indoors)	STALK AND STEM DISEASES	ROOT DISEASES
damping off fungi	gray mould	nutritional diseases	gray mould	fusarium root rot
storage fungi	yellow & brown leaf spots	pink rot	hemp canker	root knot nema
genetic sterility	downy mildew	gray mould	fusarium canker	broom rape
	olive leaf spot	powdery mildew	stem nema	sclerotium rot
	nutritional diseases	brown blight	anthranose	cyst nema
	brown blight	virus diseases	striatura ulcerosa	
	bacterial leaf diseases		dodder	

SOURCE: *Journal of the International Hemp Association* 3, no. 1 (1996)

IN THE FINAL ANALYSIS INDUSTRIAL HEMP COULD BE DESCRIBED AS: *"hardy, tolerant, versatile".*

COURTESY OF: JOHN MCPARTLAND AND THE INTERNATIONAL HEMP ASSOCIATION

HEMP SUPPRESSES WEEDS?

Yes it does!

Every text on hemp going back thousands of years see *"Marihuana The First Twelve Thousand Years" by Ernest L Abel* which describes in detail the smothering ability of Hemp. There is however one catch whereby the plant is vulnerable at the seedling stage.

Once it is a week or two old, provided the strike rate has been high & evenly distributed, NOTHING seems to be able to compete. Hemp has been successfully used as a smother crop throughout history. Even when grown as a seed crop at a density of one or two plants per square meter Hemp shows this ability to smother other plant life.

The Chinese have a seed variety with seeds produced in abundance the size of small peas & reportedly use NO herbicides.

HEMP HURD IS 77% CELLULOSE

***Many pro-hemp people** (even the NZHIAI in the past) regurgitate this claim, it is simply incorrect.*

The outer bark which contains nature's longest & strongest natural fibres, has between 38% to 52% cellulose content (Bedetti and Cigaralli 1974, van der Werf 1994) The hurds, the inner woody core, were found to vary between 32 & 38% cellulose (Bedetti and Cigaralli 1974 and van der Werf. 1994)

HEMP IS ESSENTIALLY A HOT CLIMATE CROP

There is some debate on this, given that the plant is and has been grown throughout the world in all sorts of soil & climatic conditions. A fair assessment would be that Industrial Hemp is global in distribution with regional specific cultivars obviously performing well in their regions of origin. In the New Zealand context as an agricultural crop, Hemp is more suited to temperate climates, with reasonable rainfalls (3-4 inches per month). The further from the equator the better as Hemp is light / daylength sensitive. Seeding / flowering needs to be delayed as long as possible for optimum economic returns, unless being grown specifically for seed production. The onset of the reproductive phase significantly reduces the quality of fibre produced. Fibre quality is also reduced by heat but increased by wind provided it is not too strong. In hot, dry climates, as a rule of thumb, Hemp produces more resin & poorer quality fibre. In mild humid climates less resin is produced, the fibre is stronger & more durable. This means unless cultivars are specifically developed for the conditions, potential Hemp growers in Canterbury, Tasman / Motueka & similar climatic areas in New Zealand would be unwise to place too much reliance on the Hemp fibre. They would be wiser in the first instance at least to concentrate on Hemp seed (a much higher value crop anyway) and producing cultivars specifically for their region. This raises another somewhat interesting point. Seed produced in say Canterbury will not be a good seedstock for Southland due to soil and climatic differences. This means that any New Zealand region seeing itself as the seed stock supplier for the rest of the country would be wise indeed to revisit this prognosis and review it very critically. We are not saying that this is not a possibility, we are simply stating that all available evidence shows that best economic returns are generated from acclimatised regional specific cultivars.

Alternatively, whole coarse fibre could be the desired end use as Australian Hemp Resource and Manufacture (AHRM) are promoting in Australia, where the quality of the fibres such as is required for clothing, fabric, etc, is not as critical.

"The bast fibres of hemp are the only fibres strong enough to be used in a pultrusion technique that produces a wood substitute product which is currently being sold overseas as fire-proof doors and edgings, umbrella spokes and even as alternative building material for construction of whole houses. The product again is stronger than steel, flexible, sawable, insect-proof and obviously fire-proof. This product is being made in New Zealand".

SOURCE: AUSTRALIAN HEMP RESOURCE AND MANUFACTURE

HEMP
(CANNABIS SATIVA L)
HAS BOTH MALE & FEMALE PLANTS

The Cannabis genre indeed has both male & female plants. This is the plant's natural state and is called dioecious, which means the male and female are separate plants. Throughout history it has been known that the male plant has superior, finer, stronger fibre. The male plant bears the pollen, the female the seeds. Fibre quality reduces significantly once the reproductive process starts. Unfortunately the male plant usually starts the process before the female & once the male's flowering is complete the male plant dies. In earlier times male plants were 'pulled' separately, a very labour-intensive job, in order to get the superior fibre. It is worth noting that only the female plant is considered useful by marijuana growers, the male plant is pulled and discarded for fear of pollinating the female & thus reducing the female's THC content. Authorities should note this fact as in the NZHIAI view it demonstrates the futility of attempting to produce marijuana in industrial Hemp crops. A Russian hemp breeder first recognised the advantages of a monoecious hemp cultivar; an artificial cultivar that has both male and female on the same plant. It's advantages are higher seed production and uniformity of crop readiness for harvest. The disadvantages are that it requires annual breeding selection, as in progressive plantings it regresses to the dioecious state, produces less seed in successive generations and has slightly inferior fibre to correctly harvested dioecious varieties from the onset.

There is a third type artificially created that is a female predominant variety (for seed production). This occurs by pollinating dioecious females with monoecious pollen.

Irrespective of which cultivar is used, in a farming situation seedstock for the following year must be carefully bred by seedstock specialists as the plant diverges quite markedly from its parents if allowed i.e. there is a natural wide diversity of characteristics.

INDUSTRIAL HEMP REVERTS TO HIGH THC IN 2-8 GENERATIONS

"The plant is an annual. When some of the crop is retained for seeds for propagation there is some concern that there will be reversion to THC production within about 8 generations".

EXCERPT FROM "COMMERCIAL CULTIVATION OF CANNABIS SATIVA FOR PRODUCTION OF INDUSTRIAL HEMP: LEGISLATIVE AND SECURITY ASPECTS OF RECENT AUSTRALIAN TRIALS"
Ministry of Health, New Zealand September 1997, by Chief Advisor Regulation and Safety Dr G.R.Boyd.

It's quite understandable that Dr Boyd inserted this as the possibility of hemp reverting to high THC is widely referred to by many authorities and indeed pro hemp persons. We use it here not as an indictment of the report - simply as an illustration. Nor is the NZHIAI holding itself up as an authority above all others. However, it is quite possibly crucial to the development of a New Zealand Industrial Hemp Industry, which MUST confront the issues on the basis of statistically significant data & FACTUAL evidence. Therefore we offer the following in the knowledge that all things are possible. We suggest that the converse is far more likely.

Cannabis Sativa L, Industrial Hemp in its natural state (wild) is a low THC plant. Scientific analysis of 'wild' hemp in the USA, Vietnam & Australia show an average THC content of 0.6%. The Hunter Valley discoveries of wild hemp in Australia in the 60's are thought to be left over from early attempts at Hemp farming in Australia. In many states in the USA there still grows wild hemp, called ditchweed, with negligible THC content, left over from commercial crops some 50 or 60 years ago. Quite obviously they have not reverted to high THC. Vietnam has wild hemp growing in most of the country. It provides villagers with a useful income, is harvested, processed and woven by hand to produce narrow long bolts of rough but appealing cloth.

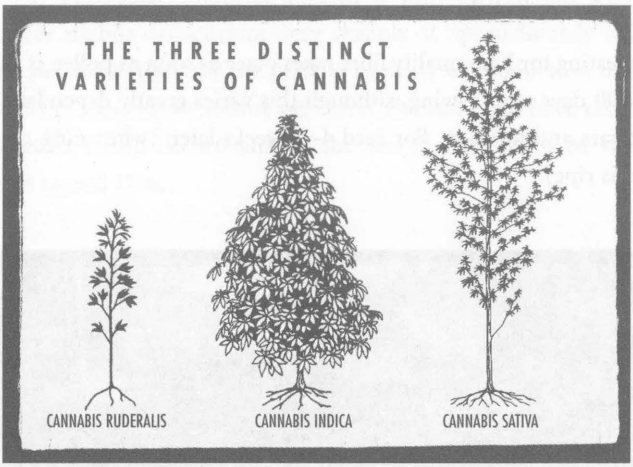
"Hemp is naturally a low THC plant with wild-types averaging a THC content of 0.6%. It is only through intensive selection that high THC cultivars are maintained. In addition, the genetic expression of THC can be very readily reduced and 'fixed' at a low THC. Hemp is fertilised through outcrossing whereby pollen is carried for kilometres by wind. Pollen produced from a stalk crop (the male matures prior to the female) is likely to invade illegal crops of marijuana and devastate the next generation by reducing the THC content. The amount of this low THC pollen entering illegal crops will be significantly high and effective". SOURCE AUSTRALIA HEMP RESOURCE AND MANUFACTURER

Maybe we should be adding another type to the two previously discussed man-made varieties of hemp - MARIJUANA.

THERE ARE THREE DISTINCT VARIETIES OF CANNABIS

Since the 1930's it has been generally recognised that there is only one main species, however:

This is a much debated topic in the scientific community. Some say they are all one variety, others that there are three distinct varieties; Cannabis Ruderalis a small spindly plant. Cannabis Indica, a large bushy many - branched variety supposedly the high THC cultivar & Cannabis Sativa L the tall Industrial Hemp variety. The NZHIAI does not have the expertise to say which line of thinking is correct, and given that the debate continues within the scientific community, we offer it simply for interest value. Many say that soil, climatic and geographic locations are probably responsible for these variations; others argue vigorously that they are distinct sub species.



THERE ARE PROBLEMS GETTING MALE / FEMALES TO MATURE AT THE SAME TIME

This has been a problem throughout history and apparently one of the reasons the monoecious variety was developed. As previously stated there are advantages & disadvantages with the monoecious cultivars, possibly the major one being the high cost of annually producing monoecious seedstock followed by the reduced fibre quality.

Quite clearly, research into cultivars for specific regions and end usage applications will be costly and ongoing.

HARVESTING

Harvesting time is dependent on end usage. Hemp is harvested prior to seeding for strongest fibres, or when the seeds are mature for multi purpose crop. The crop is hard on conventional farm machinery & some minor modifications are required due to the long stalk length and toughness.

Hempflax in Holland has developed specialised harvesting machinery. In England, Ian Lowe of Hemcore says that Hemp has broken every machine they used & innovations were required. Sickle side cutters are used in combination with big square or round bailers. No doubt as the crop develops worldwide the appropriate MODERN machinery will be developed. For now traditional machinery does the job, if somewhat onerously.

Harvesting for high quality fibre takes place as soon as pollen is shed, 70 - 90 days after sowing, although this varies greatly dependant on cultivars and location. For seed 4- 6 weeks later, (when 60% of the seed is ripe).

COURTESY OF: BIOREGIONAL DEVELOPMENT GROUP, SUTTON ECOLOGY CENTRE, UK

RETTING

Dew retting *(a microbial decay of pectin, the substance that glues the outer fibre to the inner woody core)* in the field is possibly the most attractive traditional method of separating the outer stalk fibres from the inner woody core *(hurd)*. This is weather dependant and should be completed with several machine turnings of the stalks *(similar to hay)* within 12 to 18 days. Other methods used in the past, such as pond retting or stream retting, which use moisture and bacteria to complete the process are not practical or possible in modern times. There are many methods of decorticating now being developed, such as steam explosion and ultrasound. Possibly machines such as the transportable Hill Agriculture decorticator are more attractive as the other methods require transport of the crop as it is cut and therefore very bulky. Decorticators are available from Hempflax in Holland; the Irish are making world class Hemp processing machinery. France has a complete processing line available for about NZD 500-000, quite possibly NZD $1,000,000 imported housed & fully operational. The Canadians have produced a portable mobile decorticator very cheaply at approximately CD$120-000 which processes 1 tonne per hour. They say the price & capacity of production models would come down to CD$50,000 processing 4½ tonnes per hour. The Austrians have recently developed an impressive field retted Hemp decorticator. If the raw material is to be stored the moisture content should not exceed 15%.

COURTESY OF: BIOREGIONAL DEVELOPMENT GROUP, SUTTON ECOLOGY CENTRE, UK

HILL AGRA SALES

Presents

Fibre - X
Portable Fibre Extractor

The Fibre - X Portable Extractor can be used to decorticate (separate) the fibres and hurds and other products from field - dried fibre-bearing stalks. The long fibres are delivered off the end of the Fibre - X Extractor, while the hurds and tow are dropped under the machine.

CAPACITY: The Fibre - X can be made in different lengths and widths to achieve the required tonnage per hour.

POWER: The Fibre - X Extractor can be driven hydraulically, electrically, or by PTO at variable speeds.

SPECIFICATIONS: Modular frame units contain the indenting and scrutching rollers. Rollers are interchangeable, spring - loaded and adjustable. Modular units can be easily disassembled. High quality sealed regreaseable bearings are used on the rollers for long life. Power to low speed rollers is transmitted through cut steel gear drives. High speed rollers are driven by high speed chain and sprockets.

OPTIONS: This Canadian built machine can be supplied with various options to suit different methods and conditions of operation.

For further information Contact:

HILL AGRA SALES

R.R.3 Shelburne, Ont. Canada L0N 1S7

Phone: (519) 925-3618 Fax: (519) 925-6441

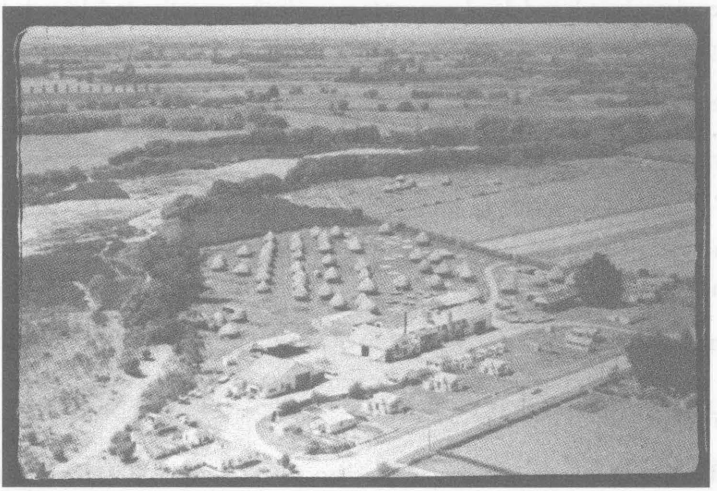
E-mail: Hillagra@headwaters.com.

PROCESSING AND VALUE ADDING

HEMP NEEDS TO BE PROCESSED CLOSE TO GROWING AREA

Due to the bulky nature of the raw material & its number of components with quite different applications, this is an indisputable fact. In the view of the NZHIAI it is a positive aspect however, as it will by necessity reverse corporate centralisation of production which could easily revitalise ailing rural communities.

The Research & Development dollars are only just starting to be spent in this area with some promising results, portable decorticators which are able to separate out the various components that make up the useful parts of Industrial Hemp. Whole Hemp pulping technology has been developed, and plants are being setup in Canada & Victoria, Australia with the assistance of the Ukrainians, who developed the process.



HEMP FLAX, GERALDINE APPROX. 1950. COURTESY OF: GERALDINE MUSEUM

PRIMARY PROCESSING

This form of processing would, in the case of a fibre crop - involve splitting the dried (and retted) hemp stalks into their 3 main parts.

The 3 parts include 2 types (lengths) of Bast fibres from the inner and outer layers of the stalk and the hurd from the woody inner portion of the stem. Crops allowed to fully develop would also under the right circumstances yield another marketable commodity, seed.

As Hemp has not been cultivated by western cultures on any real scale for the last 60 years, there are many areas of its production, which need to be developed. There is a demand for suitable machinery to harvest fibre and seed crops, to ret and decorticate the stalks and to process them into higher value added products.

Local output from the processing phase will range from providing marketable commodities suitable as raw materials for other industries, through to maximum added value, when hemp based finished goods are produced and sold.

With minor changes to existing production technology some product can already be produced; others will require research and development to provide the expertise and knowledge needed to satisfy their production cycles.

LOCAL BIO REGIONAL DEVELOPMENT

New Zealand and its rural communities are desperately seeking sustainable alternative land uses. Hemp, because it provides enourmous amounts of value added potential offers just such an alternative.

The Idea behind the Bio Regional Development of a Hemp crop, involves local industry and the community working with local farmers to provide and manage suitable machinery and infrastructure close to the crop.

The size and extent of this processing and the associated returns will depend on the location, local support, and financial commitment available.

Suitable locations exsist in New Zealand for this Bio Regional Development to occur.

A CANADIAN REPORT

INDUSTRIAL HEMP FACT SHEET

Legal Status of Industrial Hemp in Canada

Industrial hemp, or Cannabis sativa, has suffered from much confusion surrounding its association with its medicinal cousin, Cannabis indica. It is only through the efforts of advocacy groups like the Canadian Industrial Hemp Council and growers from around the world that Canada is finally bringing itself in line with the United Nations Single Convention on Narcotics (1961) which excluded industrial hemp from inclusion as a narcotic. Legal seeds will be available from China, Finland, France, Hungary, Italy, Poland, Romania, and Ukraine.

As a result of stakeholder communications with representatives from all levels of government, Health Canada, who, as a result of the recent passing of the Controlled Drugs and Substances Act in the summer of 1997, is committed to releasing regulations by January 1998 to administer the growing of industrial hemp. These regulations will come into force on March 1, 1998.

A second round of stakeholder meetings will take place between January 25-27, 1998. These meetings will finalise the regulations with respect to the various positions of all stakeholders.

AGRONOMIC CONSIDERATIONS

PLANT CONSISTS OF APPROX: 10% roots, 60-70% stems, 15-20% lvs; 5-15% seed. Chemical composition: 80%dm, 90%cellulose and hemicellulose, 4%= lignin recommended ratio of nutrients:=20N:P:K 1:0.7:1.5 (fibre) 1:0.8: 1 (seed) or about: 90-120kg/ha N 70-100 P2O5 150-180 K2O 15-20 CaO

SEEDING RATES: Fibre: seed rate 60-70 kg/ha, 7-20cm row spacing 450-500 seeds/sq.m. 3-4cm deep

SEED: 20kg/ha @ 50cm spacing.

IRRIGATION: 30 in./year

PLANTING RANGE: 45-60 degrees latitude

YIELDS - FOR SEED: 0.7-2 tonnes seed/ha with 2-4 tonnes fibre/ha

FOR FIBRE: 7-15 tonnes/ha

FARM PRODUCTION (including irrigation): $200-400/hectare

RETURNS (PROCESSED MATERIALS)

CLEANED SEED: US$200-600/tonne

HEMP HURDS: US$50-100/tonne

BAST FIBRE: US$50-300/tonne

WHAT IS HEMP?

Hemp is an annual herbaceous plant of the species Cannabis sativa, meaning "useful hemp." It is a high yield commercial fibre crop which flourishes in areas with temperate climates, such as Canada. Hemp grows successfully at a density of at least 150 plants per square meter, and reaches a height of two to five meters in a three month growing season. Every part of the plant can be used commercially.The stalk of the hemp plant is harvested for its fibres. The fibre length and the content of cellulose and lignin are important quality parameters for raw material used in the cordage, textile, paper and fibreboard industries. Hemp plants yield three different types of fibre:

BAST FIBRES

Hemp has traditionally been grown for its valuable and versatile high quality (primary bast) fibres. The production of these fibres has traditionally been a very labour intensive process. After harvesting, the hemp stalks are soaked with water to initiate a process of retting (the decompositional separation of the bark-like bast fibres from the inner woody core). After the retting process, the plants are dried and then the fibre must be separated from the hurds, shaken out, and cleaned. Recently, alternative fibre separation processes have been developed, using technologies such as ultrasound and steam explosion, which as much less labour intensive. Once separated, the bast fibres are ready for spinning and weaving into textiles, or for pulping into high quality pulp. Because of their high tensile strength, bast fibres are ideal for such specialised paper products as: tea bags, industrial filters, currency paper, or cigarette paper.

BAST FIBRES COME IN TWO VARIETIES:

1. Primary bast fibres which are long and low in lignin. These fibres are the most valuable part of the stalk, and are generally considered to be among the strongest natural fibres known to mankind.
2. Secondary bast fibres which are medium length and higher in lignin are less valuable and become more prevalent when the hemp plants are grown less densely (therefore less competition for light), and thus grow shorter, fatter stalks.

A CANADIAN REPORT (CONT...)

HEMP HURDS

The hurds are the short fibred inner woody core of the hemp plant which comprises 70-80% of the stalk. They are composed of libriform fibres which are short and high in lignin.

The hurds are essentially the by-product of the process of extracting bast fibre from the hemp stalks, and were traditionally considered waste.

Though the fibres are shorter, the lignin content of hurds is similar to wood, so there are opportunities for using the hurds for tissue or newsprint pulp.

Hurds can also be used to produce a wide range of products including rayon, biomass fuel, cellophane, food additives, and industrial fabrication materials.

HEMP SEEDS

Hemp seeds are also a potentially valuable commodity.

The seeds have exceptional nutritional value.

They are second only to Soya beans as a source of complete vegetable protein and hemp seeds contain all 8 essential amino acids in the correct proportions humans require. Hemp seeds also contain 30-35% oil by weight.

Hemp seed oil is approximately 80% polyunsaturated essential fatty acids (EFA's). Furthermore, the proportion of these oils in hemp seeds most closely match the ratios which have been determined to be most beneficial to human nutrition.

Jean M. Laprise-Kennex (left) Noble Villenevue -Minister of Agriculture Canada

COURTESY OF: KENEX LTD, CANADA

However, although the oil is very healthy, this high percentage of polyunsaturated fats also makes hemp seed oil somewhat unstable and so subject to fairly rapid rancidity unless preserved.

Hemp seed oil can be extracted or expressed and used in cooking, or industrial uses such as paints, varnishes, detergents, cosmetics, and lubrication. The left over seed casings are a rich source of protein which can be ground into flour.

HEMP AND THE ENVIRONMENT

In both its cultivation and uses, hemp is considered an exceptionally environmentally friendly crop. Hemp requires little or no pesticides as it is naturally pest resistant. Hemp is also a natural herbicide known for its ability to smother weeds when grown at a density suitable for producing high quality bast fibre. Hemp also has a lower net nutrient requirements than other common farm crops, since it can return 60-70% of the nutrients it takes from the soil when dried in the field.

However, prior to the nutrient recycling, hemp extracts more nutrients per hectare than grain crops due to its fast biomass production. Its deep=20 root system is also very beneficial as it is effective in preventing erosion, cleaning the ground, providing a disease break, and helping the soil structure by aerating the soil for future crops, when it is grown in rotation with other crops.

Hemp is also a particularly high yield fibre crop. In fact, an acre of hemp produces more biomass than most other crops. As a result hemp can be used effectively in many applications as an alternative to wood or fossil fuels. For example, hemp can be used as a renewable, low polluting source of biomass fuel, or hemp pulp could easily replace wood pulp in paper making.

AGRONOMICS

There are two potentially viable approaches to growing hemp commercially: growing hemp for fibre or for seed. If hemp is grown for fibre, it is sown very densely (a seed rate of 55-70 kg/ha is standard, though for very high quality textile fibre a much higher seed rate can be used). Since hemp grows so quickly, at this density hemp can effectively out compete weeds, and so weed control measures (herbicides) are not needed. If hemp is grown for seed, it is grown much less densely (typically 10 -15kg/ha) and is not as effective at suppressing weeds, so herbicides will probably be required. Hemp seed may be drilled or broadcast, though drilling is recommended for uniformity. A standard grain drill or modified alfalfa seeder can be used for sowing.

Pesticides are generally considered unnecessary in the cultivation of hemp, although researchers in Manitoba in 1995 reported that several pests had to be contended with. For the purpose of this paper, pesticide use will be considered to be nil to reflect the majority of findings and hemp's organic farming potential. Another positive aspect of the crop is that once planted, no further husbandry is required until harvest, thereby minimising labour costs and energy consumption.

COURTESY OF: DOUG BROWN , WHITE BUFFALO RENEWABLES, CANADA

A REVIEW OF THE AUSTRALIAN TRIALS

TASMANIA

Hemp trials have continued in Tasmania since 1991. Over the years conditions for trialing hemp have not altered, and in fact authorisations to trial are becoming more difficult to obtain. Patsy and Frits Harmsen of the Tasmanian Hemp Company have been trialing each year. In 1992 the University of Tasmania started trialing through a PhD student Shaun Lisson. His PhD was finished in 1997. Only Patsy and Frits continue to trial.

In 1991 authorisations to trial were received too late for sowing.

In 1992/93 the first crops went in and yields of up to 8-tonne/hectare dry stalk were obtained. Local paper mills developed an interest and begun preliminary laboratory trials with the stalk.

In 1993/94 Kompolti was grown for seed, but suffered significant losses due to waterlogging.

1993/94 A co-operative study between the University of Tasmania and Australian Newsprint Mills and members of the Tasmanian Hemp Company commenced.

1995 - 1997 Results are to be published by Shaun Lisson in his PhD. Yields of up to 14-tonnes /hectare were recorded.

1997/98 The Tasmanian Hemp Company continues to trial hemp. They have shifted their focus to hemp seed oil production, but are having problems with detectable traces of THC in their oil (1995/96 50ppm, 1996/97 100ppm). Reviews into the levels of THC permissible in the oil are being reassessed, but no conclusions have been forcoming.

SOUTH AUSTRALIA

In 1995, trials on low THC (0.3%) hemp plants were permitted. Only the Yorke Regional Development Board received a licence. South Australian Research and Development Institute and IAMA Technical Services conducted the research. Only French cultivars were trialed. Yields of up to 9.9 tonnes/hectare dry weight were obtained.

RESULTS **• Cultivars flowered too early when sown in winter. • Should probably be grown where summer crops traditionally grow (ie when there is rainfall) • Insect pests had little effect on hemp growth, though Lucerne flea was detected.**

Due to lack of evidence for economic feasibility, these trials ceased. Unfortunately much of the economic feasibility was based on its future as raw material for the textile industry.

A REVIEW OF THE AUSTRALIAN TRIALS (CONT...)

VICTORIA

In 1995/96 due to public pressure, ten low THC (0.35%) hemp cultivar trial sites of one-hectare or below were permitted under the Drugs, Poisons and Controlled Substances Act 1981. Individuals or consortia using private funds conducted the trials and an Interdepartmental Hemp Steering Committee drawn from all relevant government departments, plus representatives of the Victorian Farmers Federation and universities was formed to regulate the trials.

Security was kept practical and achievable by requiring sites to be out of sight of roads, close to a farmhouse, and were surrounded by lockable gates and either an electric or barbed wire fence. Persons who required unsupervised access to trial sites were obliged to undergo a national police records check.

Three hundred expressions of interest were received and forty applications were received by the closing date. Nine sites received authorisations to trial, two dropped out, leaving seven for the first year.

Seed was obtained from breeders in France and Hungary. Some French lines were contaminated with soil and some Hungarian seeds had very poor germination (15% for Kompolti).

RESULTS • **Flood irrigation killed seedlings below 50cm • Requires good soil/seed contact. • Some trials managed yields of up to 11.6 tonnes/hectare dry weight.**

In 1996/97, only five sites were sown. A new source of Kompolti was found. Because the first year was almost trouble free, security provisions were relaxed by not requiring a surrounding fence/site if two padlocked fences lay between the site and the nearest road.

RESULTS • **50% of seedlings at one site died from the fungal disease Rhizoctonia • Some trials managed yields of up to 12-tonnes/hectare dry weight • Hungarian cultivars were more likely to go over 0.35% THC content • Variability in THC levels of the same cultivars grown at different sites was difficult to explain. This could be overcome by requiring that imported seed be harvested from a crop that has been inspected, sampled and tested for THC by an independent certification authority.**

In 1997 new legislation has been introduced which effectively legalises industrial hemp in the State of Victoria. Unfortunately this has still not addressed the illegality of transporting material off farm sites, making it extremely difficult to move stalk to end processors...

NEW SOUTH WALES

In 1995/96 due to public pressure, trials on low THC (0.3%) hemp plants were permitted under the Drug Misuse and Trafficking Act 1985. Private or public entities using private funds can apply. Trials must be surrounded by man-proof fencing, and require an up-front fee of $1,000. THC must be tested twice during the growing period. Only one trial commenced at the University of New England under glasshouse conditions.

RESULTS

- **Hemp tended to perform better than kenaf in stalk yield and growth parameters**
- **Temperature seems to play a more important role than day length in inducing maturity.**

More than 250 expressions of interest were made resulting in 20 applications in 1996/97 and 16 in 1997/98. In 1996/97 four trials proceeded. Two produced no worthwhile results, the other two trials produced less than 5-tonne/hectare dry weight. THC content ranged from 0.14% - 0.76% across all varieties and sampling dates. Proposals for 1997/98 trials include a possible vector for an oral vaccine that can reversibly inhibit reasonable breeding in kangaroos, a biological pump for disposal of sewerage effluent, an oilseed plant.

NSW proves to be the most draconian in its trialing conditions. Although it is stated that crops should be moved to end-users, there are barriers to transporting material off trial sites.

NSW is the most secretive about hemp trials. Information is extremely difficult to obtain. Most of the information for this section was derived from a brief presented at a national hemp workparty in August 1997.

QUEENSLAND

Queensland Cabinet approved hemp trials in June 1997, they are yet to pass amendments to the Drugs Misuse Act 1986 through parliament to allow trials to commence. From all indications, trials will be conducted using similar rules and regulations devised by Victoria for their trials.

One substantial difference with the legislation passing through Queensland is the inclusion for allowing cultivars to be imported in from areas with similar latitude and climate to Queensland. To allow these often uncertified seeds in, THC levels of 1% or below are permitted under strict conditions. This will see the first hemp breeding program in Australia.

Legislation is expected to pass through parliament in March 1998 ready for plantings in early September 1998.

A REVIEW OF THE AUSTRALIAN TRIALS (CONT...)

WESTERN AUSTRALIA

In 1996 due to public support, trials on low THC (0.35%) hemp plants were permitted. Licenses were issued to participating farmers and two research officers from Agriculture Western Australia under the Poisons Act 1964. An Industrial Hemp Steering Committee consisting of representatives from Health, Police, Agriculture and the farming community, was formed to regulate the trials.

One hundred and forty expressions of interest were received, 54 applications resulted with eight applicants approved.

French and Hungarian cultivars were used. Services provided by the Agriculture Western Australia coordinators were not charged for. Applicants were not permitted to sell any material produced in the trials.

Overall low yield estimates may be due to oven drying which compare unfavourably with Victoria air-dried samples.

RESULTS

- All cultivars matured too early (within six weeks)
- Highest yield was 10.66 tonnes/hectare dry weight
- Irrigation induced signs of salinity and waterlogging
- Often poor germination
- Anthesis commenced at three sites within 40 days after 700-800 degree days of thermal time
- Insects found included Helicoverpa sp., African black beetle, Rutherglen bug and brown pasture looper but did not cause any detectable damage
- European cultivars did not seem to be suited to Western Australian growing conditions.

Proposed trials for 1997/98, will include two cultivars from the Netherlands. Only two of the seven trials will continue, but another trial will be initiated in the north where summer rainfall dominates.

Since December 1997, the Western Australian Government have been approached by some overseas interests in purchasing hemp pulp. They are now considering commencing trials with hemp varieties suited specifically to Australian conditions.

COURTESY OF: AUSTRALIAN HEMP RESOURCE AND MANUFACTURE (AHRM), ARTICLE ALSO PUBLISHED IN IHA JOURNAL

Chapter 4

DOLLARS AND SENSE

POTENTIAL MARKETS FOR A HEMP CROP IN NEW ZEALAND

The bulk of China's production is utilised in their Textile industry, while Eastern European production goes into both their textiles and the twine and cordage industries.

These markets are well established and have the required extensive infrastructure and resources already set up. In New Zealand we are undercapitalised to compete with some of these applications and end uses.

France produces construction and paper products, the pulp for which is provided by pulping plants in Spain. Isochanvre, by Chénevotte Habitat is a construction material used to build subdivisions in France. It uses a registered process to mix the hemp hurd with a lime solution which petrifies the vegetable matter in to a mineral form, producing a composite 1/6 of the weight of concrete but which requires no reinforcing. The finished product has excellent thermal properties, is non-flammable and like many hemp products is fungicidal and anti-bacterial.

MEDICAL APPLICATIONS

It is not our intent to explore this aspect of the plant at this time as many of the benefits are related to high THC cannabis plants. Medically even New Zealand Ministry of Health recognises at least some of these beneficial uses (Cannabis & Health 95/96) The only comment the NZHIAI should make at this time is that this is another possible point of revenue for farmers.

It is worth noting here that the NZHIAI has a similar position to that of the IHA regarding Marijuana, however we are a little more specific as quite clearly we are interested in Cannabis Sativa L legislation, (Industrial Hemp). So where the IHA uses the word "Cannabis" the NZHIAI uses the word "Marijuana". I.e . the NZHIAI is not a forum for the legalise marijuana debate and has no interest in the same except where it may impact on the orderly development of a New Zealand Hemp Industry.

CONT...PG 48

The NZHIAI encourages the investigation of other potential end uses for our local crop.

- FIBRE - suitable as a fibreglass substitute, (a New Zealand company in partnership with Australians is already pursuing this application in the fibre optic industry) for geotextile applications and other industrial fibre uses, plus craft and limited manufacture of high quality paper and textile products. The long fibres can also be used in the pultrusion of reinforcing beams which are as strong as steel for the construction industry.

- THE HURD - 32-38% of the hurd is cellulose, the building block of plastics. Therefore biodegradable plastics can and are at this time being produced in Germany. Patents have also been filed by US Companies. It is also naturally extremely absorbent and is thus prized as animal bedding and for use in industrial clean up situations. The hurd and the fibre are also used to produce concrete substitutes and fibreboards

- THE SEED - can be marketed directly as a nutritional feed stock suitable for both human and animal consumption. The oil pressed from the seed has applications in the health industry, and as an industrial oil or lubricant and fuel source.

- To produce energy the biomass from the entire plant is combusted or prolytically converted to produce Methanol. With a 94% fuel to feed efficiency ratio it is extremely effective, and does not produce any sulphur emissions.

The above list is by no means all inclusive and new applications are being developed daily. There are currently an estimated 25,000 constructive commercial uses for Industrial Hemp, many of which have a great export potential as major overseas markets reflect the growing demand for green products.

Opportunities also exist for exporting the expertise and technology associated with setting up a local hemp industry and the required infrastructure.

As can be seen there are numerous potential markets requiring various degrees of further processing and associated investment in capital. It is this diversity which is the key benefit of a local hemp industry as it provides ongoing opportunities for development, profitable investment and employment in New Zealand.

A LAYMAN'S ANALYSIS OF NEW ZEALAND'S RURAL ECONOMY

At the turn of the century New Zealand had the third highest standard of living in the world. In 1998 New Zealand does not even register.

The NZHIAI initially attempted to analyse the New Zealand rural economy in isolation. In modern times this is not possible as they are all inter or co-dependant on other factors. A simple example is a farmer who had a cattle herd with a book value of NZ $1 Million. Mad cow disease hits the headlines. What was the herd's value the next day, month?

What this demonstrates is the lack of certainty in the New Zealand primary producing sector. Similar "wild fluctuations" have affected sheepmeat, wool, forestry, dairying, kiwi fruit, apples, deer and fishing in recent years. This possibly demonstrates the need for security and as wide a diversity of production as possible so that the collapse of a market is cushioned. With its wide diversity of end applications Industrial Hemp may be part of the answer. **We think it is.** The New Zealand economy has a long history of boom and bust, this needs acceptance and redressing.

New Zealand, variables considered, can expect economic growth of 1% in 1998, (Treasury predicts 4.5%). It is extremely hard work for many businesses in New Zealand simply to maintain the status quo. Bankruptcies are high and as we all know, farms are businesses first and lifestyles second. The perception of wealth, as in assets, often erodes daily. Property values in the producing sector fluctuate dramatically as councils struggle to attract investment and stem the flow of departing members from the community, (Southland for example). New innovative ways of thinking are desperately sought. We live in a throwaway society and globally there are simply too many of us to maintain this status.

As Governments around the world begin to establish legislation aimed at reducing the negative environmental effect of human consumption, sustainable alternatives will have to be sourced. Alternative raw materials, alternative production technologies and alternative energy sources will all be in great demand.

The successful businesses and countries of the future, will be those that can evolve to meet these challenges.

We now know that an alternative exists. History supports the viability of seed and natural fibre products in meeting the demands of industry for raw materials.

WHY DO WE NEED A NEW ZEALAND HEMP INDUSTRY?

The Government is aware of considerable interest in Industrial Hemp, which is increasing exponentially. It is apparent that realising the potential problems for our environment is no longer enough. The government are not particularly concerned with quantifying the true environmental cost at which a product comes on to the market.

To get them to act on this matter, they want to know in dollar terms why they should support or even consider hemp. To effect meaningful change we must make it stick on economic grounds.

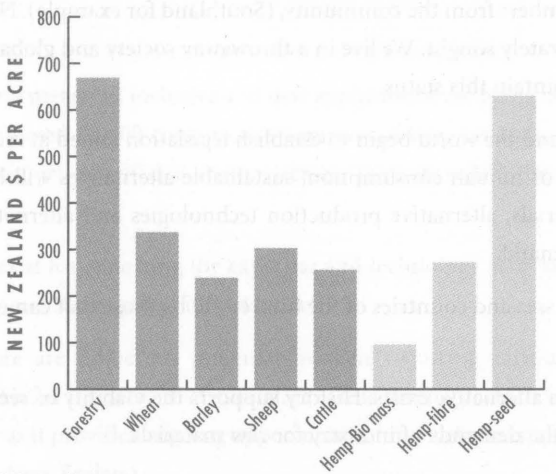
SO LET US CONSIDER THE BOTTOM LINE:

Monetary benefits for the farmer, the immediate community and the nation

The purpose of the following forecasts and actual financial information is to give the reader an idea of the economic potential of an Industrial hemp crop.

THE FARMER

COMPARISONS OF GROSS MARGIN BY LAND USE



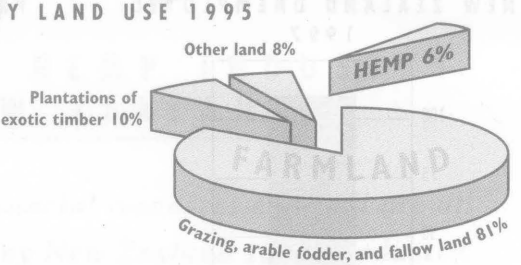
Source information:

Lincoln Budget manual 1996 *Hemp information based on current overseas results*

THE COMMUNITY

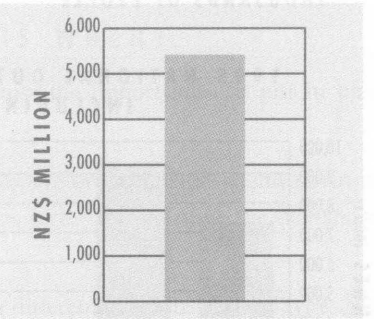
NEW ZEALAND FARMLAND BY LAND USE 1995

TOTAL FARM LAND: 16,577,942 HA
TOTAL NUMBER OF FARMS: 68,776
SOURCE: NEW ZEALAND OFFICIAL YEARBOOK 1997



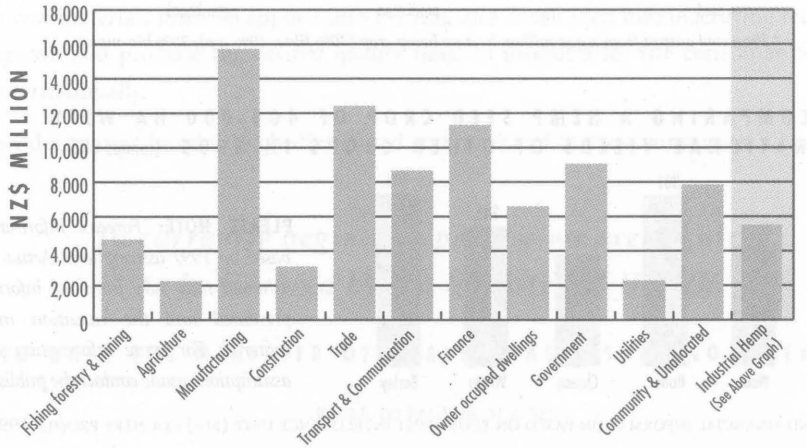
PRIMARY GDP EFFECT OF A 1 MILLION HECTARE HEMP INDUSTRY

The Forecast financial information for a 1 Million Hectare hemp crop (representing 6% of the available agricultural land) relate entirely to the effect of primary production. Therefore they do not take into account the downstream effects which would conservatively add a further NZ$10 Billion to the New Zealand Economy.



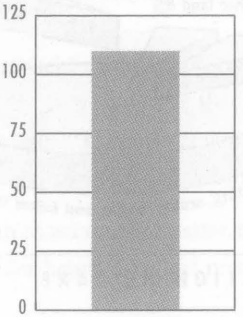
NEW ZEALAND GROSS DOMESTIC PRODUCT 1995

GDP information per EIU Country Profile 1997-98



THE NATION

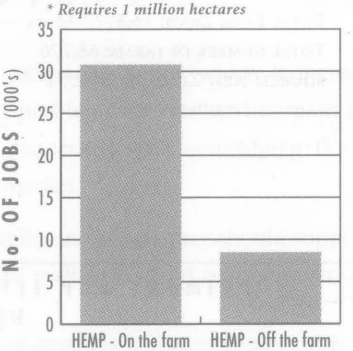
NEW ZEALAND UNEMPLOYED 1997



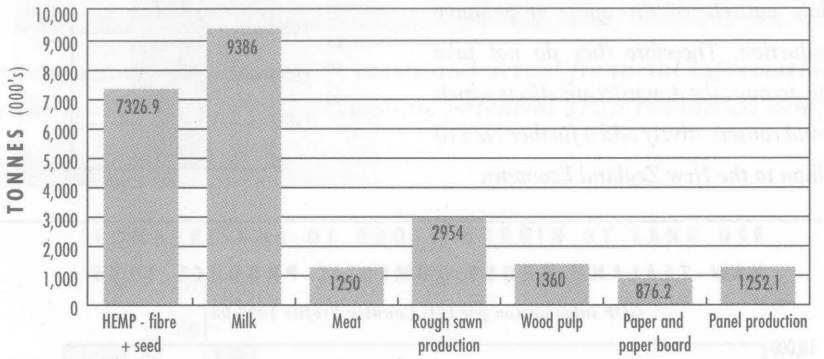
THOUSANDS OF PEOPLE

JOBS DIRECTLY CREATED BY A PRIMARY HEMP INDUSTRY*

** Requires 1 million hectares*

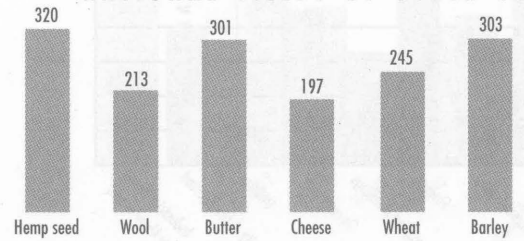


1995 NATIONAL OUTPUT OF PRIMARY PRODUCE INCLUDING A HEMP CROP*



** Projected output from a one million hectare hemp crop (40% fibre, 40% seed, 20% bio-mass)*

COMPARING A HEMP SEED CROP OF 400,000 HA WITH NATIONAL YIELDS OF OTHER CROPS IN 1995 (tonnes 000's)



PLEASE NOTE: *Forecast information is based on 1997 assumptions. Actual results achieved may vary from the information presented and the variation may be material. For more information on the assumptions made contact the publisher.*

NEW ZEALAND FINANCIAL INFORMATION BASED ON ECONOMIST INTELLIGENCE UNIT (EIU) COUNTRY PROFILE 1997-98

Chapter 5

STARTING A HEMP INDUSTRY IN NEW ZEALAND

The Expertise, land, financial resources and will are all available to the emerging New Zealand Hemp Industry. The hemp issue is getting so big that the momentum toward achieving it cannot be stopped.

THE QUESTION IS WHEN?

Each year that we miss a growing cycle we also miss the opportunity to put in place the necessary research and development.

We must develop suitable seeds for our diurnal temperature fluctuations and environment. We must produce these seeds in sufficient quantities to be able to meet the demand of the farmers and consumers.

While we are developing the required seed suitable for different locations and soil types, we must have access to the raw materials which are being produced.

The technology and machinery must be developed and implemented to allow for economic harvesting and processing of the raw materials locally.

These raw materials must be applied into existing and developing manufacturing technologies; to improve and produce the desired quality finished products for the consumer both locally and internationally.

The products must be adequately distributed and marketed to these consumers.

To currently begin this process we are required to be licensed by the Ministry of Health.

TO DATE THE MINISTER OF HEALTH HAS ISSUED NO LICENSES

(REFER TO PAGE 26, 31 & 32)

NEW ZEALAND BUREAUCRACY

Our understanding is, as per the US experience that the heads of both the New Zealand Police and Customs have strongly objected to lifting the moratorium on Industrial Hemp licensing at this time.*

This is not entirely unexpected. The lack of positive support for Industrial Hemp production in New Zealand from most of the bureaucracy is, in the opinion of the NZHIAI, directly related to a lack of knowledge.

The educative process is already showing positive results in New Zealand bureaucratic circles. The process must continue in an amiable manner. (A fair assessment of the New Zealand bureaucracy would be relatively ill informed regarding Industrial Hemp, unsupportive, countered by really helpful if they have the background knowledge).

The Ministry of Health whilst not pro hemp, has been really good to deal with. We hope that rational thinking will prevail.

* SEE CHAPTER 3, PAGE 26, 31 & 32 FOR MORE INFORMATION ON THE FACTS RELATING TO THE POLICE OBJECTIONS.

IMPLICATIONS OF A NEW ZEALAND HEMP INDUSTRY

- Increased revenue streams for the farmer. Hemp can provide 3 times the current rate of return of other traditional land uses with a forecast gross margin of between $1000 and $10,000 per hectare ($400 to $4000 per acre).
- Hemp cleans and reconditions the soil, requiring less pesticides, fungicides and herbicides. Leading to environmentally sustainable use of available farm land.
- Reduction in the number of people relying on the welfare system. There are huge employment opportunities created throughout industry as all aspects of the production cycle gear up to use seed and natural fibre raw materials.
- Revitalised rural economies, not just their environments (i.e. reduction of industrial chemicals required) but the community spirit as they bio-regionally develop their locations into being important sources of primary industrial stocks.
- A reduction in the pollution and environmental impact on our waterways created by the switch from other land uses
- Full and ongoing utilisation of the skills and expertise of New Zealanders.
- Increased awareness by the general public, of alternative, environmentally friendly products. Leading to support from consumers, as they use their green dollars to buy goods produced from sustainable sources.
- An expanding choice of diversified investment opportunities both locally and nationally.
- Realised Export potential for goods and services, which meet and exceed the standards demanded by countries that lack New Zealands resources.
- Expanding total dollar tax take for the government coffers.
- A decline in the breakdown and break up of our rural economies and families.

Full utilisation of available and developing technology toward a safer and cleaner New Zealand.

FACTORS AFFECTING THE ISSUING OF LICENSES TO GROW INDUSTRIAL HEMP

The only problem met by a request to grow hemp is the perceived association of Hemp with Marijuana.

And the perception that High THC (tetrahydro - cannabinol) Marijuana will be grown in Industrial Hemp Crops. (Refer to Chapter 3, pages 26, 31 & 32.)

The many issues to be overcome, would best be achieved by the creation of a Industrial Hemp Licensing Authority. If appointed to the working party as Dr Boyd recommends the NZHAIA would be advocating the formation of this authority quite firmly.

Overseas trial plots have in most cases not reported any crop loses and it is not appropriate for the government, to assume that the cultivation of low THC industrial Hemp in New Zealand would lead to anything but, the introduction of a successful industry.

SUMMARISING THE BOTTOM LINE FOR THE NATION

- Bio-regional development will provide many employment opportunities at a local level, the flow on effect would utilise much of the established infrastructure and available labour.
- As seed and natural fibres become integrated into our economy, our primary producers would benefit. This would lead to benefits for our economy overall due to the enhanced image of our products and services, and the minimal associated environmental impacts of there production.
- The Government would directly derive benefits from decreased unemployment payments, and from the tax revenue generated from a compatible multi-billion dollar a year industry.
- New Zealanders have traditionally led the world, whether it be in sporting endeavours, social issues or in making others aware of workable alternatives.
- We now have another opportunity to lead the world, with our inherent ability to get things done and to overcome perceived and actual problems. It is up to us if we want to show the world how a sustainable approach can fit into the market place, how being environmentally aware can work for business bottom line. How this honest hard work benefits the economy and our culture.
- We need this crop now; we demand the opportunity to grow industrial hemp on behalf of our own livelihood and the environment that today's children will inherit.

This is a reality and the sooner it is acknowledged and accepted the sooner we can begin to make a difference.

Appendix 1

NEW ZEALAND HEMP CONTACTS

Research Organisations and Businesses in New Zealand

NEW ZEALAND HEMP INDUSTRIES ASSOCIATION INCORPORATED (1997)

PO Box 38-392, Howick, Auckland New Zealand.
0800 HEMP INFO. 64-9 273 2541, 64-4 477 4819.
E-MAIL: nzhemp@es.co.nz, http://www.hemp.co.nz/nzhia

HEMPTASTIC NEW ZEALAND LTD.

MAIL ORDER AND MANUFACTURER OF HEMP GOODS

PO Box 38-392, Howick, Auckland, New Zealand.
PHONE: 64-9 273 2541, FAX: 64-9 273 7396.
E-MAIL: hemptastic@clear.net.nz

CALIFORNIA & PACIFIC HEMP COMPANY LTD.

MANUFACTURER & RESEARCH

PO Box 60345, Titirangi, Auckland, New Zealand
PHONE: 64-9 817 9480, FAX: 64-9 817 9409
http://www.hemp.co.nz/ E-MAIL: tjb@hemp.co.nz

HEMPORIUM NZ

RETAILER OF HEMP GOODS

151 Cuba St, PO Box 27-504, Wellington, New Zealand
PHONE/FAX: 64-4 385 2907, FREEPHONE: 0800 GET HEMP
E-MAIL: hemp@hemporium.co.nz

GREEN EARTH LABEL

RETAILER AND MARKETER OF HEMP GOODS

1230 Dominion Road, Mt Roskill, Auckland
PHONE/FAX: 64-9 620 7296

Appendix 2

INTERNATIONAL HEMP CONTACTS

VAVILOV RESEARCH INSTITUTE (RUSSIA)

The Vavilov Research Institute is in Russia, near St Petersburg and established in 1902.

This is the world's most complete source of cannabis sativa l (Industrial Hemp) genetics, having in excess of 500 specific germ plasms sourced from over 25 countries. (The USA destroyed theirs in the 1950's). Due to the recent upheavals in Russia and subsequent budget cuts this invaluable genetic material was at risk until the International Hemp Association decided to financially support the continued accessions which are necessary every 4-5 years to ensure the seed viability. To date they have managed to do this with over 300 genetic seed stocks and even reintroduced a cultivar to Italy, its native homeland.

The IHA is always seeking contributions to this project, you may find yourself inclined to support their efforts.

INTERNATIONAL HEMP ASSOCIATION (HOLLAND)

In the view of the NZHIAI, this is one of the most informative and worthwhile Hemp organisations, well worthy of your support if you are able or inclined to. In its own words:

The International Hemp Association is a non-profit organisation established in 1992 to promote the beneficial uses of Hemp products worldwide. The IHA wants to encourage and facilitate the accumulation and exchange of information on CANNABIS. In accordance with these goals the IHA sponsors projects in several countries and publishes a journal for its members. The IHA is supported by memberships and by donations from foundations corporations and individuals.

Although many IHA members may feel that in light of the great economic potential of CANNABIS the current legal restrictions hampering CANNABIS research and Hemp cultivation should be reconsidered, the IHA does not endorse a political stance on CANNABIS legislation, nor will it serve as a forum for the CANNABIS legalisation debate. The IHA produces a journal twice a year that is the most informative we have read.

The articles are statistically significant in terms of the scientific data supplied. These journals are essential for those serious seeking in depth knowledge of all aspects of the Cannabis genre.

INTERNATIONAL HEMP ASSOCIATION
Postbus75007, 1070AA Amsterdam,
Netherlands.
TEL/FAX: 0031-20-618 8758, Iha@euronet.nl

U.S.A.

HIA. USA. (HEMP INDUSTRIES ASSOCIATION)

The HIA publishes a monthly global contacts list and newsletter. They are very good and helpful. Their objectives are to educate and assist hemp businesses and they are very successful. The HIA is well worth the joining fee, which is related to your business's turnover. You can, however, be an associate member as is the NZHIAI.

HEMP INDUSTRIES ASSOCIATION
PO Box. 1080, Occidental, CA 95465.
PHONE: 001 707 874-3648,
FAX: 001 707 874-1104
Info@thehia.org, www.thehia.org

AUSTRALIA

AUSTRALIAN HEMP RESOURCE AND MANUFACTURE (AHRM)
15 Belmont Crescent,
Paddington Qld 4064, Australia
PHONE: 0061-7 3369 5925,
FAX: 0061-7 3368 1255
E-MAIL: ahrm@hits.net.au
HOMEPAGE: http:// home.hits.net.au/~ahrm
DIRECTOR OF RESEARCH: Carolyn Ditchfield (BAgSc)
MANAGING DIRECTOR: Phil Warner

Appendix 3

BOOK AND VIDEO REVIEWS

PUBLICATIONS (BRIEF REVIEWS)

JOURNALS OF THE INTERNATIONAL HEMP ASSOCIATION (Holland) probably the most informative in depth information of its type available at this time. In depth information on all aspects of Industrial Hemp. Scientific notes. Trial analysis. Twice yearly. Fairly pricey at US$100-00 pa but essential for those with more than a casual interest.

"THE EMPEROR WEARS NO CLOTHES" by Jack Herer the originator of modern debate on Marijuana and Industrial Hemp (Jack does not separate the two) Much useful historical information and documents. VERY useful reference book. A bit heavy on the drugs issue but a must for those that want a comprehensive background.

"HEMP HORIZONS" by John W Roulac. A comprehensive upto date , practical book on Industrial Hemp. Good insights, extensive contacts and resource guide. Well written with good overview. A little repetitive.

"HEMP FOR HEALTH" by Chris Conrad. The Medicinal and Nutritional Uses of Cannabis Sativa. In depth, excellent reference book with some startling info. NO farming or crop info but in its particular field Excellent and readable. No hype but some politicking.

"THE GREAT AMERICAN HEMP INDUSTRY" by Jack Frazier. A very good history book.

VIDEOS (BRIEF REVIEWS)

"BILLION DOLLAR CROP" BY BARBARA CHOBOKY, Documentary films Australia. Comprehensive history of the cannabis plant and it's renassiance in the 90's. About 50% about Marijuana but an excellent History lesson. A+

"THE HEMP REVOLUTION" also Australian, good background of Industrial Hemp. The only Drawback is the makers try to be too artistic, none the less invaluable.

"HEMP FOR VICTORY" 15 minutes, black and white, the promo made in 1941 by the US department of Defence. They now deny having made it. Only of interest due to the historical nature.

Appendix 4

REFERENCE INFORMATION

THE JOURNALS OF THE INTERNATIONAL HEMP ASSOCIATION

THE HEMP INDUSTRIES ASSOCIATION

INDUSTRIAL HEMP. THE GREAT AMERICAN HEMP INDUSTRY. by Jack Frazier

HEMP TODAY by Ed Rosenthal

INDUSTRIAL HEMP (CANNABIS SATIVA)
ECONOMIC VIABILITY & POLITICAL CONCERNS
State of Hawaii House of Representatives Doc

FATS THAT HEAL, FATS THAT KILL by Udo Erasmus

THE EMPEROR WEARS NO CLOTHES by Jack Herer

THE 1996 HEMP BUSINESS SURVEY By Jon Gettman

THE GREAT AMERICAN HEMP INDUSTRY by Jack Frazier

NZ GREEN by Redmer Yska

HEMP LIFELINE TO THE FUTURE By Chris Conrad

HEMP TODAY By Ed Rosenthal

BEDETTI AND CIGARALLI 1974

NATIONAL ARCHIVES(NZ)
Department of Internal Affairs

INDUSTRIAL HEMP. Hemptech

REFERENCE MATERIAL

Dave Cull CANADIAN HEMP

Eco Fibres Industries Assn of Australia

HEMP HORIZONS by John W Roulac

HEMPNOTES ET AL by AHRM.

SEPTEMBER 97 REPORT By Dr GR Boyd. MOH/NZ

Doug Brown. WHITE BUFFALO RENEWABLES/CANADA.

HEMP FOR TEXTILES - Bioregional Development Group/England.

Hayo M.G. van der Werf, Journals International Hemp Association. Author "1994 CROP PHYSIOLOGY OF FIBRE HEMP (Cannabis Sativa L.)"- Doctoral thesis.

TO OBTAIN DETAILS OF INDUSTRIAL HEMP LICENSES IN NEW ZEALAND

Industrial Hemp Licensing Applications to:

M.B.WEBB

Analyst-Drug Policy Services Mental Health

OR

Dr Bob Boyd

Chief Advisor, Regulation and Safety

Ministry of Health

PO Box 133, Wellington, New Zealand

Ph 64-4 496 2000, Fax 64-4 496 2340

APPLICATION FOR MEMBERSHIP TO NZHIA

P.O. Box 38-392, Howick, AUCKLAND,

Phone: 09 273 2541, Fax 09 273 7396

25 Miles Cresent, Newlands, Wellington

Phone: 04 477 4819, e-mail nzhemp@es.co.nz

COMPANY NAME .....

CONTACT NAME .....

ADDRESS .....

.....

CITY/TOWN ..... POSTCODE .....

TELEPHONE ( ) ..... FAX ( ) .....

E-MAIL .....

ELECTORATE .....

CURRENTLY INVOLVED IN THE HEMP INDUSTRY AS .....

.....

OUR COMPANY IS A DIRECT RESOURCE FOR .....

.....

.....

.....

ANNUAL MEMBERSHIP (please pay in advance)

❑ $100 full voting membership (Businesses and Farmers)

❑ $25 1/5 voting membership (individuals and supporters)

OBJECTIVES OF THE NEW ZEALAND HEMP INDUSTRY ASSOCIATION INC.

A To act as a lobby group for the legalisation of a Hemp Industry in New Zealand.

B To educate the public of New Zealand about the attributes of HEMP products.

C To facilitate the exchange of information and technology between HEMP Agriculturalists, processors, manufactures, distributors and retailers.

D To maintain and defend the integrity of HEMP products on the market.

E To provide a seal of authenticity for members in good standing to display on Certified True Hemp Items.

F To advocate and support socially responsible and environmentally sound business practices in the HEMP Industries.

A full copy of the New Zealand Hemp Industries Association Rules can be obtained by calling or writing to the Treasurer - Richard Barge:

P.O. Box 38392, Howick, AUCKLAND, Phone: 09 273 2541,

www.hemp.co.nz/nzhia

INFORMATION ON INDUSTRIAL HEMP

"Anything that can be made from Hydrocarbons, can be made from carbohydrates". HENRY FORD. 1941

25,000 PLUS PRODUCTS

HEMPSEED OIL FOR HEALTH

INDUSTRIAL HEMP THE FACTS

EASY TO SOW! EASY TO GROW!

NEW ZEALAND A HEMP COLONY?

BIOMASS ENVIRONMENTAL FUEL!

INDUSTRIAL HEMP FOR A FUTURE

INDUSTRIAL HEMP = EMPLOYMENT

WHY INDUSTRIAL HEMP! WHY NOW?

THE ECO-CROP OF THE 21st CENTURY

RURAL NEW ZEALAND'S FUTURE CROP

INDUSTRIAL HEMP = DOLLARS AND SENSE!

The NZHIAI believes that history will show the supression of knowledge regarding Industrial Hemp to be CRIMINAL.

This book is attempting to rectify that!