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Attachments:	Robert Franck Hemp Report .pdf

FOOD STANDARDS Australia New Zealand
Te Mana Kounga Kai – Ahitereiria me Aotearoa

FSANZ: Applications and Submissions - Submission

Wednesday, 27 April, 2011

1. Assessment Report Number: Application A1039

2. Assessment Report Title: Application A1039 - Low THC Hemp as a Food

3. Organisation Name: Textile and Composite Industries Pty. Ltd.

4. Organisation Type: Other

5. Representing: Textile and Composite Industries Pty. Ltd.

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12. Submission Text: Submission to FSANZ for the legalisation of Non-Drug Industrial Hemp grain products, including the Oil and the Meal, as food in Australia and New Zealand. 27th April 2011. Our Organisation has developed and proven a new and revolutionary method of processing Industrial hemp for fibre. It also has the facility to gather the grain. Our focus has been on the Textile and Composite fibre aspects in Industrial Hemp. We have recently conducted a presentation with Deakin University in Geelong to demonstrate that we can convert a hemp stem sample into a fibre that can be spun on cotton systems within 3 hours of processing from field to cotton spinning system. The recovery of fibre was over 90%. This is totally revolutionary as the best other systems as used in China and Eastern Europe can, at best make a semi-mechanical conversion of fibre from the field in 3 months and their recovery rate for textile fibre is less than 15%. "The commercial development of green decortication and degumming for hemp could change the balance of world fibre markets, and increase the range of applications for hemp fibre." UK Flax and Hemp Production (flaxhemp-report DEFRA 2005.pdf)ADAS, Centre for Sustainable Crop Management, Cambridge. UK for Department for Environment, Food and Rural Affairs July 2005. Our Organisation has developed and proven a green decortication and degumming system. We have left the food aspect of industrial Hemp to our very capable hemp industry associates. However, it is very important to us that hemp foods be legalised so that we are brought into legislative and production harmony with other hemp producing countries. Currently we are excluded from a very significant and high earning

food industry, which operates throughout Europe and North America. This exclusion impacts directly upon our own Australian fibre industry and the utilisation of our technology. The Benefits of the Industry. Industrial hemp was one of the main crops grown by our First Fleet forebears because the British Navy needed the fibre for ropes, uniforms sails and caulking. They also needed the grain as a healthy food source for their mariners. There are three main product groups that are gained from this valuable Hemp crop. The First Product Group comes from the Bast fibre. Until the advent of the cotton gin, Hemp fibre was the most traded commodity in the world for thousands of years. It can be made into high quality textiles. It can be used as a recyclable, strong light replacement fibre for fibre-glass in many products. THREE tonnes of fibre can be grown in 90-140 days per hectare. Our technology makes it economical to grow and process hemp for these products in Australia. Its potential for earning export dollars for Australia has been estimated at between $1.5 and 3.5 Billion Dollars per years by the leading consultant at the Textile Institute of Manchester. Robert Franck's Expert report ends with this estimate of the market for our fibre. "It would therefore not be unreasonable to aim for a market of between 1.5 and 3 million tonnes of hemp fibre, that is between 5% and 10% of the market for 'cotton type' textile products. At US$1.20 per Kg this would yield revenue of between 1.25 and 3.5 Billion $US." R.R. Franck C.Text, FTI, FRSA 6th December 2000. Our system can quickly and economically harvest and process fibre which can be used immediately for fibre-glass replacement in composites such as lightweight car bodies, furniture, building products etc. It is also a source for strong paper. With a second set of processes, it can be made into a textile quality fibre that can be spun in cotton and wool spinning systems and made into high quality industrial, protective and fashion apparel. The Second Product Group comes from the Hurd or Shiv woody pith. This material has very significant insulation properties and is used throughout the UK and Europe for building materials. The Hurd or Shiv can also be used as a biomass source for the production of fuel ethanol. At its lowest level, it can be used on the farm as a source of organic carbon for the creation of humus in the soil. There are carbon sequestration benefits in using it this way. It is used throughout Europe as non-allergenic animal bedding. The Queen of England uses it exclusively for all her race-horses and other stock. The Hurd is also a source of high quality cellulose for the burgeoning natural plastics industry. SEVEN tonnes of Hurd can be grown in 90-140 days per hectare. The Third Product Group from Hemp comes from the Grain. Hemp grain is known by many as the best source of essential fatty acids in the human diet. It is also known as the best source for plant grown protein. This protein is known as the most easily digestible plant protein. The two main food products are from the seed oil and from the seed flour. My expert associates will have discussed these issues in their submissions. We will not repeat them here as our focus and reasons for the legalisation of hemp foods include all of their arguments and points because they are right, they are just, and they will allow us to consume the foods and enjoy the health benefits from them. Up to ONE tonne of grain can be grown per hectare. Reports from Canada indicate that the retail value of the hemp food sales to the USA along has reached $600 Million per year. This is double the reported size of the industry from last year. Australia could have a part of that market, indeed of the European market as well, if this restriction on hemp food were removed. Our submission is related to the fact that the hemp industry has three legs. At this moment we can legally only create a fully expressed and profitable industry with two legs. That is inherently unstable. Banks and investors know this. In order for us to develop this valuable industry in all of its three main divisions, we need to have the restriction on the grain food products removed. Then we will have a stable industry firm and supported on its three natural legs. Farmers will be more ready to grow it, food entrepreneurs will develop products from it, the healthy foods if makes will increase overall national health, and the fibre and hurd by-products from the production of this food, can be processed in our system for the other two main industry sectors. Most importantly, BECAUSE there can be a food industry, there will be investment in the development of the overall three legged industry. Hemp is easy to grow Organically and Biodynamically. The benefit to the nations

soils will be very significant. Farming by those methods also sequesters carbon at a very high rate and such farming will contribute directly to Australia meeting Carbon Reduction goals. If farmers are allowed to grow hemp for food, many thousands of hectares of land will be in production across the length and breadth of Australia and contribute to all industrial and export sectors. Australian seed breeders have already developed hemp varieties that can be grown for food, fibre and hurd from Tasmania right through NSW and into Queensland and throughout West Australia. There would be valuable industries developed to export the bulk of the fibre to mills in China, India and SE Asia. The Hurd would be used as a valuable building material to reduce the demand on forests for timber. It can be used as a valuable source of biomass for Fuel production and reduce the demand on Oil. Our organisation lobbied the Kennett Liberal Victorian Government to legalise the farm production of Industrial Hemp. This was achieved in 1998. That is the same year that Canada altered its laws. Canada allowed for the development of a Hemp Food Industry. Victoria did not. The Hemp industry of Victoria has been unable to develop because of lack of investment – even though we have the key technology to develop the fibre and hurd industries. In stark contrast, Canada, who have no significant or economical hemp fibre processing systems, have developed a valuable and exponentially expanding hemp industry based upon hemp foods. We have a better opportunity in Australia than they have in Canada. We can grow the foods, when we are permitted, but we also have the technology to make vast export profits from the fibre and the hurd products as well as replace imports and also to develop alternative building broiducts from an annual crop. Hemp will produce in 90 to 140 days THREE tonnes of quality fibre per hectare: all of which our revolutionary system can recover for textiles or fibre-glass replacement. Hemp will produce in 90-140 days SEVEN tonnes of hurd or shiv material per hectare: all of which our system can recover in pristine condition for building materials, cellulose plastics, paper or ethanol production. Hemp will produce in 140 day mature crops up to 1 tonne per hectare of valuable health giving food grain. Hemp will produce 4 tonnes of organic carbon material in the soil per hectare and thus hemp in atmospheric carbon sequestration by encouraging the soil microbial actions to sequester up to 260 tonnes of CO2 per hectare per year. ALL OF THIS FROM THE SAME HECTARE AT THE SAME TIME. These benefits and consequent export earnings can become real, ongoing and constantly developing once this 'obsolete' restriction on the production and use of hemp foods in Australia is removed. We respectfully request that the restriction on hemp foods be removed and all State governments and the Federal Government support the overall hemp industry all ways available to them.

RAFEX (EUROPEAN) Ltd

HEMP
THE PRESENT AND POTENTIAL WORLD MARKET

Summary
Cotton, Polyester staple fibre (PESF), Flax, and Hemp share the market for 'cotton type textile consumer products' and their relative share of this market is strongly influenced by price. At the moment cotton and PESF prices are around US$1/kg whilst flax And hemp are 50% to 100% more expensive.
At the present time hemp fibres occupies a very small place in the textile industry. This situation could change dramatically in the next 5 years if the present development work being carried out in Australia enables hemp fibres to be produced at a price below that of Flax but still somewhat above that of cotton.
Hemp's share of the market would be further increased if, as is expected, the hemp fibres produced by the new technology enable the fibres to be spun into finer yarns, thus enabling them to be used for lighter weight fabrics than at present
There are also substantial markets to be developed in non-textile areas.
It is expected that if the above conditions are met the market could reach between 3 and 6 million tonnes per years in 5 years time, at a value of between US$1.25 and 3 Billion.

1 Background
Hemp (Cannabis Sativa) is one of the oldest textile fibres known to humankind. Probably its first mention in written history (although previous archaeological evidence exists} is in an Edict issued by Charlemagne around 800 AD decreeing that every farm in his empire should grow flax and hemp. From perhaps 5000 BC its fibres were used to make ropes and other heavier textile products.
From the middle ages until the mid 20th century it was the principle fibre used for marine and other cordages, sailcloth and other industrial textiles, although the finest fibres were spun to produce yarns for lighter weight furnishing and apparel fabrics.

2. The Present Market
2.1 As with flax, hemp began to loose its market share of textile fibres to cotton in the mid 19th century, and this decline in its use accelerated in the mid 1950s when the first synthetic fibres, particularly polyamide (nylon) and polyester, and later, polypropylene started being manufactured in substantial quantities
Hemp for textiles is grown and manufactured at present in Hungary, Romania, Poland, Russia and China. Smaller quantities are produced for other purposes (paper, animal litter, building insulation and composite products in the UK, France and several other countries.
Total world production at present is approximately 70.000 tonnes of fibre.
The quantity of hemp produced for end uses other than textiles is difficult to establish, and is not immediately relevant to our present purpose.

2.2 Legal Constraints to the present Market. The drug marihuana is produced from hemp and for this reason its cultivation is unlawful or strictly controlled in many countries, and in particular most of those which constitute the principle consumer markets for hemp fibre (North America and Western Europe).
However this situation is changing for two reasons:

i) Low content TCH (the active ingredient of the drug) varieties of hemp exist and practically all, if not all, European hemp fibres are at present produced from such varieties.

ii) In the main consumer markets the public and political attitude towards the drug itself is to a certain extent changing, principally due to its potential medicinal qualities.

3 The Textile Fibre Market

3.1 Competition. The sensible way to look at competition between textile fibres is not to concentrate on the prices and technical qualities of the fibres themselves but to look at the final products made from these fibres and assess the competitive position of these in relation to each other.
Hemp's principle end-uses are string, twine and rope, and heavy canvas fabrics. A certain quantity is now also being used for clothing (Trousers, sportswear)
Polyester, cotton and flax are also used for these end-uses and synthetic fibres, principally polypropylene, nylon and polyester are dominant in the cordage market.

3.2 World Fibre Production/Consumption. Taking one year with another the world's production and consumption of textile fibres are in balance. The worldwide demand for 1999 was:

Fibre	Annual Production (K tonnes)		% Total	Price US/kg
Cotton	19.000		33	0.80 – 1.00
Hemp	70		0.1	1.40
Flax	625		1.1	2.00 - 2.40
Synthetics	30.000	(10.000)*	52.5	0.80 – 1.00
Other (wool, jute, etc)	7.500		13	
Total	57.195			

*Polyester staple fibre (PESF) Sources: The Textile Institute, Textil Organon (For hemp: RRF)

The important factors to consider are:

i) That cotton has the major part of the total market (33%) at a price slightly above that for polyester staple fibre, that hemp and flax are used for end uses that are dominated by cotton but they are 2 to 2.5 times more expensive

ii) That the major part of PESF is used in 'cotton type end-uses, making a total market for these end uses of the order of 24.000 K tonnes

iii) That world production of cotton has probably nearly reached its maximum because

a) Cotton requires good, well watered land in Mediterranean or semi-tropical climates,

b) For this land cotton competes with food crops.

c) Not only practically all such land in the world is now being cultivated but that the available area is diminishing due to over-cultivation (Kazakhstan, for example)

iv) That the world's population is increasing at about 2.5% per year, that the world's fibre and food crop needs are increasing at a greater rate (probably around 4%) due to the overall increase in purchasing power.

v) That this will lead, possibly in the next 5 to 10 years, to a shortage of appropriate land and that in competition for this land, food is likely to win over cotton.

vi) That this, in turn will lead to:
a) An increase in the price of cotton,
b) An increase in the production of polyester staple fibre. (see below iv).
c) Greater opportunities for flax and hemp.

vii) Evidence that the world production of cotton has just about reached its maximum is that its consumption has remained static for the last five years whilst polyester staple fibre (PESF) has increased by 23%. PESF is the only possible replacement fibre for cotton in the present price range)

4 Hemp versus Flax.

4.1 Fabrics of similar construction and weight made from 100% hemp and !00% flax are, as far as the consumer is concerned, indistinguishable. Microscopical examination of individual fibres is necessary to identify each fabric. Their performance is also similar, with some possible advantages to hemp (abrasion resistance)

4.2 Flax, however, has two serious advantages:

a) It is better known, has an excellent image of quality and luxury and has been well promoted in the past.
b) It can be spun to much finer counts (thinner yarns) thus providing a far greater range of fabrics, from very light weight cambric handkerchiefs and blouse cloths to heavy furnishing fabrics. Hemp, on the other hand, is limited, <u>at the moment,</u> to heavier weight cloths and industrial end-uses. It does have the advantage, however, of being more ecologically sound as it needs no chemical weed killers (it grows so fast that weeds are smothered) and it requires little, if any, fertilising.

4.3 <u>Price</u> When comparing the prices of the two fibres, and hence fabrics made from them, it is unwise to base conclusions on price comparisons taken at a specific time. This is because their prices are even more volatile than those of other textile fibres. For example the price of good quality flax has doubled over the last nine months.
A safer planning assumption is that, historically, hemp is in the same price range as flax, thus placing it at a severe disadvantage, due to the factors set out in 4.2 above.

4.4 However, this situation may be about to change dramatically in the near future because:

a) Trial plantings of appropriate varieties in Northern Australia and Tasmania, and through genetical engineering in Poland have produced plants 4 metres high. Usual growth maxima are about 3m. This increases the 'dry yield' per Ha. by about 50% and is bound to bring the price down. It will be very difficult, and in the writers view not possible to increase the yield of flax to anywhere near the same extent in the medium term as all that can be done as far as agricultural husbandry is concerned has been done. The yield of flax fibre per Ha. in Northern France has doubled over the last 40 years and is, on average, more than twice that of Eastern Europe and China.
b) Improvements in the technology of decortification (scutching), could increase the proportion of long to short fibre in the yield (long fibre can be worth five times more than short fibre), increasing the total yield of fibre per Ha. and also increasing the efficiency and thus reducing the price of the decortification operation. Work in this area is well advanced in Australia, Austria and Germany.
c) Whilst this has not been demonstrated yet it seems likely the hemp fibre produced by the Australian decortification technique can be spun to finer counts than is possible at present. This would lead to a considerable increase in the size of the potential market, as it will enable a greater variety of fabrics to be produced for a greater variety of end-uses.

5 The Market Potential for Hemp

5.1 The eventual size of the market will depend on:
a) The price of the fibres produced (long and short) 'ready for spinning' relative to cotton and flax. The closer to that of cotton the bigger the market.
b) The skill with which the market(s) is/are developed. (Marketing, End-product development, Promotion)

5.2 The total market consists of several distinct markets.
a) The Textile market, which itself divides into markets for long and for short fibres, and within these two categories, for end-uses requiring 100% fabrics or fabrics in which the hemp would be mixed with other fibres such as cotton, flax, wool, silk, polyester, acrylic.
b) Non-textile markets. Building insulation, paper making, fibre re-enforced composite products.(All these are recently developed products in Europe whose markets' are growing)

In addition there would be markets for waste and other derived products such as shive, hurds etc. These markets are animal litter, (especially chickens and horses), cellulose pulp (for paper manufacturing) and chip board. (All these are existing products in Europe whose markets' are developing)

6 Market Objectives

6.1 It is always difficult to assess the size of a future market for a good that is not yet, to all intents and purposes, on the market. It is relevant, however, in this context to bear in mind the very rapid growth of synthetic fibres shortly after they appeared on the world market in the 1950s. The figures for polyester, which is the fibre of most interest to us as it is used for many of the same textile end uses as hemp, are shown in the appendix and indicate how fast a new fibre, properly priced and marketed, can penetrate the textile industry. It should also

be remembered that PESF was launched at a price closer to that of merino wool than that of cotton.

6.2 If we assume:

i) That the new Australian produced hemp is launched on the market in 2001 at a price of US$1.80/kg, cheaper than flax but higher than cotton, in order to test the market and carry our commercial development trials, both of 100% hemp fabrics and fabrics produced from blends of hemp with other fibres.

ii) That over the next 5 years, as economies of scale (both in hemp fibre production and in the manufacture textile products made from these fibres) come into effect, the price of hemp gradually decreases to US$1.20/kg

iii) That world fibre consumption will continue to increase at 4% per year and that therefore in 5 years time the market for 'cotton type' textile products will be around 30 million tonnes.

iv) It would therefore not be unreasonable to aim for a market of between **1.5 and 3 million tonnes** of hemp fibre, that is between 5% and 10% of the market for 'cotton type' textile products. At US$1.20 per Kg this would yield **revenue of between 1.25 and 3.5 Billion $US.**

R.R. Franck
C.Text, FTI, FRSA

6th December 2000

Appendix: The Growth of Polyester

Polyester started being developed By Imperial Chemical Industries in the mid 1950s. In addition to developing its own markets in the UK and the Commonwealth by 1960 ICI was beginning to grant licences under its patents to several other companies, in France, Germany, The USA, Italy, USSR, China and Japan and world production increased rapidly.

Year	000 tonnes	% all fibres	% cotton	RPI*
1955	Pilot plant			
1960	122	0.9	1.3	4.17
1965	456	2.4	3.8	2.94
1970	1645	7.6	14.0	1.33
1975	3366	14.0	28.0	0.85

*Relative Price Index: Polyester price (!.7 decitex staple fibre) divided by the cotton price ("a" Index, middling. (1.3/32 inches} CIF Northern Europe Source CIRFS.

Since 1975 the RPI has hovered above and below unity by some 20 points.

File: Adrian Clarke Australia