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To: The Secretary,
Environment, Resources and Development Committee, Parliament House, Hobart Tas.

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Subject: **Growing and Processing of Industrial Hemp in Tasmania**

I agree with the decision to consider growing industrial hemp in Tasmania. As an introduction, I have over 30 years of experience as a textile technologist and manufacturing manager in Tasmania. During this time I have worked with most textile fibres, including flax, which is similar to hemp. This work has been mainly with woven and knitted textile substrate, but I am familiar with pre-weave fibre treatment. My early work experience was in a UK textile research laboratory, and my main function there was chemically modifying natural fibre cellulose to further enhance product marketability. After the closure of the Sheridan Textiles Hobart mill, I became involved with growing olives, and now own an olive oil press.

My interest in the state's olive industry extended to industry association committee work, which I have done for the past 11 years mostly as an Association Secretary. I've also represented the Tasmanian olive industry as a representative on several DPIWE/TIAR advisory committees. During this period I worked as project manager for the opening an indoor market and helped set up an olive oil processing plant for the owners of the state's largest olive grove. I still act as an olive oil processing consultant for this grove.

Whilst working as the manager of the indoor market and the olive oil extraction plant, I received several expressions of interest from Tasmanian stone fruit growers and cosmetic producers concerning the crushing of oil from other crops. These included rose-hips, which currently grow wild. (Due to their nutrition chemistry, I believe that these should be considered as a future commercial crop.) Other than avocado, an olive press will not process other fruit or seed. Therefore, I investigated purchasing a small screw expeller press (hempseed oil press), for the indoor market's owners. Unfortunately, at that time my employer did not pursue the purchase of this machine.

I would recommend that a future Tasmanian hemp industry focus on producing only premium quality products. There are already many other nations producing low quality hemp fibre. High quality hemp fibre is similar to flax, which is used to make linen. It would be great if Tasmanian hemp textile fibre produced products as famous as "Irish linen".

"Australian Weaving Mills" at Devonport may still have most of the equipment to process woven hemp textile, but I doubt if they can extract the textile bast fibres from the plant's stem. I assume that Geoff Parker is still the owner of AWM. I knew Geoff many years ago when he worked in Sheridan Textiles, Hobart and he may be interested in producing table linen to complement his towel production.

Hemp can be grown with considerably less water, herbicide, insecticide and fertiliser than cotton. From an environmental and commercial perspective, it would be advantageous if high quality primary bast fibre hemp displaced some of the world's cotton production. I suspect that the availability of narcotic grade cannabis varieties has been the reason why hemp fibre has not been more effectively developed using modern technology.

Secondary bast fibres from top quality hemp fibre are invaluable for strengthening "high tech" plastic composite panelling. If it hasn't already been considered and subject to its osmotic effect, there may be scope to use hemp fibre in fibreglass boat hull construction to improve impact and flexing strength properties.

To produce high quality hemp fibre, high density planting is recommended to restrict lateral branching and leaf internodes as these produce irregularities in bast fibre thickness. It is best grown quickly to develop a long singular stem with minimal woody development. It is then harvested during early flower formation by cutting off the stem near the base and below the lower branches.

I suggest that Tasmania initially consider licensing growers of fibre end-use varieties who own large properties with suitable soils, which are in low to medium altitudes and receive high rainfall. This will allow even and rapid succulent growth, thus minimising bast fibre irregularities from branching and reduce lignification of the stem.

Most of the world's hemp fibres are retted in the field or in still water ponds, and therefore receive irregular moisture exposure rates and temperature. The cut stems are then best retted in flowing water in controlled conditions of time, temperature, surface area exposure and water flow. Retting stems here should follow the current world's best practice, which I believe is currently done in stream flow.

The control of decomposition of the outer epidermis to loosen the bast fibres is best done in tepid running water. (However, there are other methods under investigation which reduce the retting time considerably.) From current technology, I suggest the stems could be retted in re-circulating tanks, indirectly heated by industrial waste warm water or even geothermal streams. Waste water from these tanks is suitable for irrigation, but should not be returned directly to any natural waterway.

I have read that a process known as 'steam explosion retting' is also under investigation. From what I can gather from the process, one of my past department's continuous steamers at Sheridan Textiles could have been easily modified to carry out this task. Once modified, the super heated, low pressure steam chamber would have easily processed 1-2 tonnes per hour. Sheridan had two of these machines and I assume that they were scrapped when the mill closed. However, they may have been shipped to Sheridan's sister mills in SA or Vic. However, I would expect that there are still many other similar machines available.

Hemp's woody stem centre could be then dried and shredded for many other uses including chipboard, coarse paper and hemp-crete building blocks. The latter use may even throw a partial lifeline to Hobart Brick Works, or perhaps some of their block forming machines could be retained and/or purchased for use later.

For seed production, I suggest that only **organic growers** on moderately large properties be initially licensed to grow those hemp seed varieties suitable for our climate. Certified organic seed production is more marketable and it attracts premium prices. Amongst other nutritional assets, hemp seed contains the ideal percentage of omega 3 and 6 fatty acids. Organically certified cultivation would also be an important end-use consideration for the seed crusher's by-product.

Hemp seed growers should be located in drier areas of the state especially during autumn flowering (hemp flowering is naturally induced by shorter daylight hours). The south-east or southern midlands would be ideal locations. Compared with fibre variety density planting, seed variety should be reduced. It is recommended to prune the main stem during vegetative growth stages to induce branching. This will ultimately reduce flower bud size on the main stem, which will become heavy and sink back below the canopy. Excluded air circulation will expose the flower head to attack from mold. The most common mold affecting hemp crops is *botrytis cinerea* and it will contaminate seed products.

Seed within the hemp flower head ripens progressively and this takes some time. Any unripe green seeds present in the flower head will need to be removed as waste after harvesting, as they will reduce post-harvest seed storage viability. Exposure to rain during flower head ripening will also induce mold problems. I recommend that hemp seed should be sold for off-farm processing and the dried stems baled and stored on-farm for their direct sale to housing block manufacturers, board and paper mills. Alternatively they could be shredded and sold, as this product makes an ideal stable bedding material.

Incidentally, several years ago I heard that Prof Gunther Laufenberg, a Bonn University food researcher had discovered that olive press waste water when applied as a dilute spray, will deter the development of *b. cinerea* on berry fruit and even potato blight. I contacted Gunther, received more detail and then forwarded this to DPIWE agricultural research. DPIWE told me that they did not have funding to investigate, but in the interim suggested I get anecdotal evidence from farmers using the spray. Unfortunately I didn't know any berry fruit and potato growers, so the olive waste water from the olive press at Moonah still attracts a fee to be transported away and disposed as low grade bio-hazard. Perhaps this organic fungicide spray may assist future growers of industrial hemp.

Hempseed meal produced as a by-product during oil extraction is an ideal fish and stock food. There is therefore scope to consider it economically suitable to be a partial replacement for the environmentally **non-sustainable fish meal** used in our fish-farm industry. Organically grown hemp feed meal should be a minimum pre-requisite before it is added to the marine environment. Being of a botanical origin, un-consumed hemp seed meal may also have a reduced pollution effect on marine sediments near fish farms.

I recommend that a pilot mill for hemp and other oil seed processing be set up in the Bridgewater/Brighton industrial areas. This would give centralised proximity to south east and southern midlands growers and access to rail. It is also a logical base to transport hemp meal feed to the south and west coast fish farms. I also suggest that the hempseed mill also has a moderately large olive oil press*, the latter operating on a commission use basis. The dried waste from the olive press can be reprocessed in a hemp seed crusher to recover a small proportion of low grade olive oil. The olive meal waste is suitable for stock food, but is also could be made into moderately highly combustible fuel bricks or pellets.

*Several years ago, I discovered that many areas of Tasmania produce the world's most nutritious olive oil. The mono-unsaturated oleic acid content was slightly over the world's International Olive Council's maximum specification for extra virgin. Because of this fact and the high tocopherol content, I patented and trade marked the oil to hopefully create a marketing point of difference for Tasmanian production over other extra virgin olive oils. Media news of my patent attracted an enquiry from Japan's Mitsubishi Food Corp who were interested in a joint venture, but later declined because of insufficient current and projected oil volumes from my own plus 17,000 tree from another grove.

Including an olive oil extraction machine in a hemp seed oil processing mill, will assist the state's olive industry to increase production volume and quality. Currently, olive oil processing machines in Tasmania are small, resulting in commission processing charges up to 3 times more than usual mainland rates. Harvested olive fruit is often stored prior to crushing because of machine capacity problems, and this is not a "best practice" industry recommendation. If required, I can more fully expand on the rationale behind the inclusion of an olive fruit press in the proposed hemp seed mill.

Our climate produces extra virgin olive oil that is high in polyphenol anti-oxidants and this adds to the shelf life. Hemp seed oil doesn't have as many anti-oxidants and therefore it has a reduced shelf life, plus isn't as stable to oxidation during high temperature cooking. Subject to miscibility factors, I believe that there is scope to consider blending hemp seed oil with Tasmanian extra virgin olive oil to improve the taste, nutrition, and oxidative resist properties. Problematic blending miscibility may be overcome if it is done as a hemp oil addition to olive fruit malaxation prior to decanting in the centrifuge. To my knowledge, the resultant blended product would be a world's first.

I would be interested in giving mentoring assistance to help start a Tasmanian industrial hemp industry, using my past and current experience and industry contacts. I would also be interested in becoming an owner/manager of a hemp seed and olive oil processing plant. However, for ownership I would need considerable financial assistance from Government to purchase processing machinery. My main motive for mill ownership is to get maximum control of product quality and product development. Unfortunately, my sole marketing skill is a desire to produce premium quality at an economic cost. However, I'm aware that this is often not enough of a marketing strategy to make a product popular with consumers.

Notwithstanding the above, please be advised that earlier this week I received an expression of development interest in the Tasmanian hemp industry from a business owner, whose family has aquaculture, olive oil production, building construction and food marketing interests in Tasmania.

Summarising, I consider that our future hemp industry should not be allowed to become a cottage style industry, as these already exist mainly in third world countries. Having just a few large growers and one hemp fibre producer plus one seed processor will assist QA traceability, varietal/horticultural product development and also help law enforcement detection of illegal crop strains of *cannabis sativa*.

I expect that the State Government will control licenses to grow and process industrial hemp, but through this I recommend that they also control the quality to produce only the best hemp fibre and organically grown seed. If my hemp seed mill ownership ambitions cannot be realised, I would be very happy to work on a team controlling the quality and development aspects of hemp textile fibre and seed through this licensing arrangement.

Yours sincerely,

A handwritten signature in dark ink, appearing to read 'BHR', followed by a horizontal line extending to the right.

Brian Hinson