

# HEMP, THE WORLD'S MIRACLE CROP

*Not only does the hemp plant provide valuable materials for practical uses, it produces seeds and oil rich in vitamins and minerals plus the essential fatty acids that we can only obtain from natural foods.*

by Susanna Wilkerson © 2008

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What would you say if I told you there is one plant that can serve most of the basic needs of mankind—food, shelter, clothing, fuel—but few people in the 21st century are "legally permitted" to grow it? "Is this a conspiracy?" might be your response.

Does the name "marijuana" ring a bell? It has been used to demonise the most useful species of the plant kingdom: the humble *Cannabis sativa*, also commonly called "hemp". The conditioning is so complete that even the sight of a picture of the leaf creates an enormous impact on the average person's psyche. Generally, the most immediate reaction to an image of the hemp leaf is "drugs". The connotation is negative. In order for hemp to make a resurgence into the modern world, a new paradigm needs to infiltrate into the minds of ordinary men, women and children.

In Australia in 2002, the Queensland state government legalised hemp-growing under licence. Since that time, I have been growing hemp and manufacturing products from the fibre and seed oil. Even though I've been challenged with enormous difficulties and seemingly insurmountable ignorance, I've found that the importance of establishing hemp as a crop far outweighs the opposition.

In the last year, I've attended several shows and functions addressing the general public. Interestingly, many young people are actually afraid even to try hemp oil on their skin. They ask questions like: "Will I get stoned?" If I smoke this T-shirt, will I get high?" They only recognise the hemp leaf as an illicit substance, not as the leaf of a plant which has useful, practical end uses. The most common response from people who suddenly realise the full import of hemp as a commercial crop is: "Why isn't everyone growing it?"

How could something so good become so bad? The purpose of this article is not to cover the political position and history of hemp in the last century: there has already been enough coverage of this in the last few decades from cannabis activists. Now that we are getting over that hurdle of being able to grow the crop again, let's focus on the next generation of the most positive outcomes and scenarios for realising hemp as a common household term.

Being a plant that's part of the natural world, hemp has been used by humans for millennia. Despite efforts to wipe it out, it's a tough survivor. Let's hope it's back to stay.

## Some hemp uses and raw statistics

The bark of hemp has the longest, strongest fibre of all plants. This fibre can be made into any building material, including fibreboard, roofing, flooring, wallboard, caulking, cement, paint, panelling, particleboard, plaster, plywood, reinforced concrete, insulation, insulation panels, spray-on insulation, concrete pipes, bricks and biodegradable plastic composites which are tougher than steel.

Ecologically sustainable hemp requires no herbicides and pesticides to grow (except under certain conditions). It builds humus, removes heavy metals in the

soil and soaks up enormous amounts of carbon from the atmosphere.

"Every tonne of cellulose grown and used removes 1.5 tonnes of carbon dioxide. For example, if 200,000 hectares of hemp were grown (averaging a yield of 12 tonnes [of dried stem matter] per hectare), 3.6 million tonnes of carbon dioxide would be removed".<sup>1</sup> This would have obvious benefits in reducing our carbon footprint.

Hemp is an extremely fast-growing crop, producing more fibre yield per hectare than any other source. Hemp can produce 250 per cent more fibre than cotton, with less water consumption, and 600 per cent more fibre than flax, using the same amount of land. The area of land needed for obtaining equal yields of fibre place hemp at an advantage over other fibres.

"The anatomy of the stem of hemp is crucial to its quality as a raw material for paper. The bark contains primary bast fibres (about 20 millimetres long), and may contain secondary bast fibres (about 2 mm long). The core contains fibres 0.5 to 0.6 mm long".<sup>2</sup> In comparison, the average fibre length for softwood (pine) ranges from 2.8 to 3 mm. The average fibre length for hardwood (eucalypt) ranges from 0.8 to 1.0 mm.<sup>3</sup> Because of the extraordinary length of the bast fibres (collected from the phloem or bast surrounding the stem), as compared with the length of tree fibres used in Australia, bast fibres produce higher-quality goods such as paper and fabric.

One acre (one hectare) of hemp can produce as much paper as four to 10 acres (1.62 to 4.05 hectares) of trees over a 20-year cycle, but hemp stalks only take four months to mature, whereas trees take 20 to 80 years. This information has been known about for a long time, as it was mentioned in a 1916 US Department of Agriculture report.<sup>4</sup> Hemp paper can also be recycled more often, though this fact is not of much value since hemp is a renewable resource.

If the use of all fossil fuels and their derivatives as well as trees for paper and construction were banned in order to save the planet, reverse the "greenhouse effect" and stop deforestation, then there would be only one known annually renewable, natural resource capable of providing the overall majority of the world's paper and textiles, meeting all the world's transportation, industrial and home energy needs while simultaneously reducing pollution, rebuilding the soil and cleaning the atmosphere. That resource is the same one that did it all before: hemp.

(For more background information, see Jack Herer's book *The Emperor Wears No Clothes*.<sup>5</sup> Also see the video *The Truth Leaked Out!* on YouTube.<sup>6</sup>)

## Hemp legislation, classification and processing

In most of Eastern and Western Europe, in North America (even the United States, where it is illegal to grow hemp), Russia, China, Nepal, India, South America, the Middle East and many other countries, there are no barriers to the use of hempseed products. Indeed, hemp products have been used in some countries for millennia.

The United Nations International Narcotics Control Board (INCB) tried to implement a ban on the production of hempseed for human nutrition throughout Europe. Its reason for the proposed change in legislation was that "hempseed has no nutritional value" and "is a benign way of introducing drugs to minors".<sup>7</sup> Fortunately, Hemp Union Ltd from the UK lobbied the European Commission and the UK government and so the INCB withdrew the proposal.

Here in Australia, even though most of the states are now issuing industrial hemp cultivation licences, the legislation to allow hempseed products to be used as a food source for humans is still in limbo. Previous applications toward this end were rejected by the Howard government. Interestingly, the authority that assessed the applications on hemp food in nutrition could see no reason to withhold hempseed products as a food source for general human consumption.<sup>8</sup>

Unfortunately, there is a general misunderstanding among the public about the benefits of hemp foods.

Technically, hempseeds are classified as a nut or achene. They have an outer sheath, a hard shell and an inner kernel. Before the seeds are pressed, they are cleaned, removing 99.99 per cent of residual plant matter.

Hempseed oil is pressed from the seeds of *non-drug*, "industrial" varieties of the hemp plant *Cannabis sativa* L. These seeds contain *no* THC (tetrahydrocannabinol, the active drug compound) and have *no* psycho-active effects. However, trace amounts of THC may be found in hempseed oil if any hemp plant matter happens to adhere to the seed surface during processing.

The modern production of hempseed oil, particularly in Canada since 1998, has successfully lowered THC values.<sup>9</sup> Unfortunately, the urine sample drug-screening methods employed in mining and other industries are extremely sensitive to minute traces of THC. So it's possible that by using hempseed products, an employee could jeopardise his or her drug-free status.

## Nutritional content and benefits

If all the practical applications aren't enough to convince us of the benefits of the hemp plant, then the nutritional value of hempseed should be. Hempseed nutrition

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research has produced the most astounding revelations in the last few years and is poised to blow the lid off old-world thinking.

Hempseeds are unsurpassed as a highly nutritious food. They contain anti-oxidants, protein, carotene, phytosterols and phospholipids as well as a number of minerals including calcium, magnesium, sulphur, potassium, iron, zinc and phosphorus. They are a source of complete protein and contain all 20 known amino acids, including the nine essential amino acids. The seeds and the oil also contain vitamins A (beta-carotene in a fat-soluble form), B1, B2, B3, B6, C, D and E (a natural anti-oxidant), all in an easily digestible form.

Hempseeds typically contain 30–35 per cent oil by weight, although some varieties contain up to 50 per cent oil. Hempseed oil is extremely high in essential fatty acid (EFA) content. It is nature's most balanced oil for human nutrition, with an approximate 3:1 ratio of LA (linoleic acid, an omega-6) to LNA (alpha-linolenic acid, an omega-3). In fact, this oil can provide all our EFA requirements for life due to its balanced 80 per cent EFA content (including GLA, gamma-linolenic acid, an omega-6). Its 10 per cent saturated fat content supplies energy, whereas the 80 per cent EFA constituents primarily serve as building blocks for cells and hormone production.

Essential fatty acids are necessary for good health and are responsible for the lustre in our skin, hair and eyes and even the clarity in our thought processes, as they transfer oxygen to every cell in the body. They also lubricate and clear the arteries, strengthen immunity and help prevent viral and other threats to the immune system. However, EFAs are *not* produced by the human body: *they must be obtained from food sources.*

The ultimate way to obtain our necessary EFAs is the way nature provided them: encapsulated in the shell of the seed. The next best way is from hempseed oil. (Again, legislation in several countries makes hempseed and hempseed oil consumption illegal.)

Cold-pressed, unrefined hempseed oil has a dark-green to clear-light-green colour and a pleasant, nutty flavour. The darker the colour, the grassier the flavour. The green colour is a result of the high level of chlorophyll, which is naturally present in the seeds. If you stand a litre of oil in a clear bottle in the light, the colour will then appear purple, probably due to the high beta-carotene content. All in all, the richer the colour, the higher the nutrient

value.

Hempseed oil is mainly used as a food oil and dietary supplement and is easily digestible. The content and proportions of linoleic acid and alpha-linolenic acid in one tablespoon (15 millilitres) of hempseed oil taken each day easily provide human daily requirements for EFAs. One tablespoon provides 2.5 grams of omega-3 EFA, 8.0 grams of omega-6 EFA and 2.0 grams of omega-9 (oleic acid)—a perfect balance. No other single-source oil has this ideal combination of fatty acids. Ideally, hempseed oil can be drizzled on salads or taken neat; it should not be used for cooking.

Unlike flaxseed oil, hempseed oil can be used on an ongoing basis with no risk of developing a deficiency or other imbalance of EFAs. This has been demonstrated in a

clinical study, where the daily ingestion of flaxseed oil decreased the endogenous production of GLA.<sup>10</sup> People are more likely to consume hempseed oil on a regular basis because it tastes better than flaxseed oil, which can go rancid and taste bitter far more quickly and easily.

In regard to the peroxide value (the measurement of susceptibility to oxidation), hemp averages 7.0 whereas flax is much more sensitive, coming in at 2.0 due to the high omega-3 count. Olive oil has a much higher rating at 20.0. So hemp is somewhere in between in stability, probably because of its natural anti-oxidant content.

#### Usage and storage

Highly unsaturated oils, and especially poor-quality oils, can spontaneously oxidise and turn rancid within a short period of time when they are not stored properly. Oils need to be kept in a dark, cool/cold place, preferably in a dark glass (or, even better, metal)

bottle. Hempseed oil can be frozen for a longer period of time than other oils without risking container breakage: due to its highly unsaturated fatty acid chains, it does not go solid. Furthermore, high-quality oils that are stored properly don't need any added preservatives (anti-oxidants).

Highly unsaturated oils are *not* suitable for any kind of cooking. Yet one of these oils, rapeseed oil (canola), is commonly used in commercially produced goods and for deep frying, primarily because of its low cost. Furthermore, most of the cooking oils used in fast-food production and on sale in supermarkets are processed under high temperatures; this process denatures the EFAs to the point where they become *trans*-fats—basically,

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toxins with which the body has little ability to cope. The therapeutic value of the EFAs is lost.

Ideally, food oils should always be cold-pressed and kept away from heat, air and light. According to world-renowned researcher Dr Udo Erasmus in his book *Fats that Heal, Fats that Kill*,<sup>11</sup> light is 1,000 times more destructive to EFA chains than is oxygen (p. 53). So, it would be wise to think twice before purchasing a food/cooking oil which is presented in a clear plastic or glass bottle and which has been refined, bleached and deodorised; the same goes for margarine. As the old saying goes, "prevention is the best cure".

In table 1 below, adapted from Dr Erasmus's book, hempseed oil is at the top of the list as *the* most beneficial oil. Not only does it have a perfect balance of omega 6 to 3 EFAs, it contains a portion of other fatty acids including gamma-linolenic acid (commonly found in evening primrose oil), oleic acid (omega 9, abundant in olive oil), palmitic acid (16:0) (commonly found in tropical oils) and stearic acid (18:0) (at a low level, which is good—considering that a high level works against the benefits of EFAs).

#### A protein bonus

Although hempseed is far more nutritious than soybean in virtually all respects and just as versatile, the typical reaction to hemp as a food is that it has limited applications. Coming in at

anywhere from 30 to 35 per cent complete protein—that is, containing *all* of the essential amino acids—hempseeds actually have *twice* the protein of most meat products. The other notable feature is the *quality* of the protein, which is classified as "edistine", the easiest to digest.

Hempseeds are ideal for vegans and vegetarians. One kilogram per month would provide all the protein, essential fatty acids and dietary fibre necessary for human survival—unlike soy, which is not even classified as a

food in Ayurvedic medicine. In simple terms, soy should not be an option for human consumption but used only as a nitrogen-fixing crop in repairing the soil. Personally, I would not even give it to livestock as it creates too many sensitivities in the gut. (See the Internet for many links on soy.) Hemp, on the other hand, has a nutritional profile that makes it ideal for poultry and all other livestock.

In addition, unlike soybeans, hempseeds are not genetically modified and are produced without the need for pesticides and herbicides, so generally they are as close to organic as it comes and they taste delicious.

#### More health benefits

Hempseed and hempseed oil are known to assist a variety of conditions: constipation, haemorrhoids, dry skin and hair, low metabolic rate, general weakness and low energy, tuberculosis, human immunodeficiency virus (HIV), immune deficiency, irregular hormone levels,

diabetes, eczema, psoriasis, acne, menopause, cancer, multiple sclerosis, rheumatoid arthritis, premenstrual syndrome (PMS), high cholesterol, high blood pressure, obesity, poor circulation, cardiovascular disease, Crohn's disease, gallstones, attention deficit disorder (ADD) and kidney degeneration. Using this high-EFA source in the diet supports the body in scavenging bad fats and cleaning the arterial walls

while increasing tone and flexibility in the veins and capillary membranes.

The health benefits of consuming EFAs are numerous and far-reaching. Here are some extracts from Dr Udo Erasmus's book (pp. 44-51)...

EFAs keep membranes fluid. Their tendency to disperse gives biological systems the power to carry such substances as toxins to the surface of the skin, intestinal tract, kidneys or lungs, where they can be discarded.

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**Table 1. Oil content and fatty acid composition of some seed oils (from most to least beneficial)**

Seed Type	Oil Content (%)	Fatty Acid Composition (% of total oil)					
		Omega 3	Omega 6	GLA	Omega 9	Stearic	Palmitic
Hemp	35	20	58	1.8	12	2	6
Flax	35	58	14	—	19	4	5
Soybean	17.7	7	50	—	26	6	9
Wheat germ	10.9	5	50	—	25	18	—
Evening primrose	17	—	72	9	11	2	6
Sunflower	47.3	—	65	—	23	12	—
Olive	20	—	8	—	76	16	—

(Source: adapted from Udo Erasmus's book, *Fats that Heal, Fats that Kill*, p. 237)

EAs govern growth, vitality and mental state. They pull oxygen into the bloodstream via the lungs and heart, and supply oxygen to the cells for electron transport and energy in the process of oxidation. Oxidation, the central and most important moment-to-moment living process in our body, is the burning of food to produce the energy required for life. EAs are involved in transporting oxygen to all our cells. They can be likened to oxygen magnets or sponges that pull oxygen into the body. A high oxygen content ensures immunity to viruses, fungi and bacteria.

EAs shorten the time required for fatigued muscles to recover after exercise. They facilitate the conversion of lactic acid to water and carbon dioxide. They increase metabolic rate and burn more fat into carbon dioxide, water and energy, sometimes resulting in weight loss. A balanced intake of EAs produces smooth, velvety skin, increases stamina, speeds healing, increases vitality and brings a feeling of calmness.

Alpha-linolenic acid and its derivatives can lower cholesterol by up to 65 per cent. LNA reduces inflammation, water retention, platelet stickiness and blood pressure. It also inhibits the growth of tumours, enhances some immune functions, reduces the pain and swelling of arthritis and in some cases reverses premenstrual syndrome. It has been known to kill the malaria parasite and has been used successfully to treat bacterial infections. There is no better food for a healthy heart and a strong brain.

### Topical uses

Used in cosmetics and bodycare products, hempseed oil is antimicrobial, anti-inflammatory and anti-ageing, balances skin pH and moisture levels, helps heal skin lesions and has antioxidant properties. The texture of hemp oil is super-emollient because of the loose bonds in the EFA chains. The oil is not greasy and, used topically, it is readily absorbed through the pores of the skin.

Hempseed oil may be added to any bodycare or cosmetic product, including creams, lotions, facial or body oils, massage oils, shampoo, conditioner, shaving products, lip balm, soap and many other products. In haircare products, hempseed oil increases hair elasticity, manageability and shine while moisturising the scalp.

In addition, this oil may be effective in protecting the skin from broad-spectrum ultraviolet radiation, according to recent Canadian research.

### Dr Budwig's research into EAs

Why have fats become so very significant today?

The secret of EAs was discovered by the brilliant biochemist Dr Johanna Budwig.<sup>13</sup> Back in the 1950s, she found through paper chromatography how to differentiate between various fat structures. She noticed that within the bloodstream of a person who is sick with, say, cancer, the nature of the lipids would be altered and the lipids would appear as a different colour when seen through a microscope. She found that by saturating the diet with a high volume of EAs combined with sulphurous amino acids, the weakened blood condition would right itself and the disease symptoms would disappear miraculously. These were the first clinical studies of the effect of EAs on the human organism.

At the 1957 International Congress of Nutrition in Paris, 900 expert delegates from countries worldwide heard the latest research results, and the Cancer Research Institute in Paris—equipped with the largest state-of-the-art electron microscope in existence at the time—showed that the only substance which characterised cancerous cells, as opposed to healthy ones, was isolated fat: the formation of fat in the cell nucleus, cell body and cytoplasm (that would be denatured fat, which has lost the ability to hold oxygen).<sup>14</sup>

According to Dr Budwig, in growing cells there is a dipolarity between the electrically positive nucleus and the electrically negative cell membrane with its highly unsaturated fatty acids. The cell division process begins in the nucleus of the cell. The cell body and the daughter cell are then separated and tied off by the diploid membrane. When a cell divides, its surface area is larger and, of necessity, must contain

enough fatty acid material in this surface to be able to divide the new cell completely from the original. Normal growth is always distinguished by a clearly defined course of action. In all our skin and membranes, there are constant growth processes (even in adults). The old cells have to be shed as new ones form underneath. When this process is interrupted, it means the body is beginning to die. Dr Budwig went on to say: "...the fats which are alien to the body block the metabolism of other fat in the delicate glands, capillaries and filter stations. Such solidified, heat-treated oils must be avoided."<sup>15</sup>

Dr Budwig postulated that we are in fact antennae for sunlight and that the electrons in our food serve as the resonance system for the Sun's energy. Without the

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electron-rich seed oils in our diet, we are doomed to go backwards.

### **A solution to world hunger**

In Europe and North America, the list of foods which have been created using hemp seeds is extensive; for example, hemp flour, milk, butter, nut loaf, pasta, burgers, pancakes, cookies, cakes, ice cream, hummus, textured vegetable protein, paste and bread.

If hempseed crops were established in all Third World countries or at least if hempseed foods were supplied to these countries, without a doubt this would alleviate hunger like no other foodstuff could achieve. But with the global "war on drugs" still in force, how likely an eventuality will this be? ∞

### **About the Author:**

Susanna Wilkerson, originally from Canada, has been practising naturopathy for 28 years. She lives in the Atherton Tableland, Queensland, Australia, where she has been growing hemp since 2002. Susanna has been actively promoting hemp production through publications, radio and public discourses. She is the founder of the Pure Delight Hemp bodycare range and has been doing research and development on hemp fibre building materials. She does *not* promote the use of THC—the active drug component in cannabis.

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