

The Verdant Element

Inside this issue:

| | |
|--------------------------|---|
| The Diesel Tree | 2 |
| Biofuel | 2 |
| Property Rights | 3 |
| Field to Pump | 4 |
| Environmental Farm Plans | 5 |
| Septic Systems | 6 |
| Hemp Continued | 7 |

IS THERE A FUTURE IN HEMP?

Hemp originated over 6,500 years ago in central Asia and is one of the oldest non-food fibre crops. It arrived in Canada in 1606, and its popularity increased in the 1800's with seed being distributed for free as the fibre was used for clothes, rope, paper and oil. In the 19th century other crops became more popular such as cotton, jute or trees. In 1938, Canada instituted the *Opium and Narcotic Control Act* and it became illegal to grow hemp following the United States which banned marijuana/hemp in 1937. On March 12, 1998 after a 60 year ban on growing hemp in Canada it became legal to grow industrial hemp.

Marijuana and hemp are the same genus and species of plant, but marijuana has a 40% THC content whereas industrial hemp is regulated to have less than 0.3% THC content. Currently the United States still bans the production of hemp which creates an advantage for us here in Canada to grow and process it into bio-fibre.

The hemp market in Canada is new and volatile. Producers tend to saturate the market following demand trends. Currently the average hemp field is 35-40 hectares with approximately 600 growers across Canada. We are at a disadvantage to Europe as hemp was never banned there so their market continued to grow.

France has four main hemp/biofibre companies which are all farmer owned co-operatives, Holland has two farmer owned cooperatives and the United Kingdom has one private company. In the UK, pulp and paper are the biggest industry for hemp, followed by the automotive industry (BMW has a large biofibre component), the third largest use is insulation, then with horticulture (weed suppressant and growing media), and animal bedding. A current developing market is construction with socially affordable housing, private housing, hotels, retail, warehousing and public buildings.

Hemp is a very multipurpose crop. It contains two types of fibre; long fibre (bast) is the outside of the stalks and resembles the stringy portion of celery, and the 'fleshy' short fibre (hurd) which is the inside of the stalk. The hurd can be processed into building materials, insulation, industrial absorbents, animal bedding, mulch, biofuels, chemicals and low grade paper. Bast can be made into geotextiles, ropes, textiles, carpeting, paper, biocomposites and fibre board. The third marketable product is the grain. The seeds can either be used as grain such as hemp hearts which

Continued on Page 7

THE DIESEL TREE

Half a world away in Kenya and Zambia, Bedford Biofuels mission is “to be a global leader in harvesting sustainable energy for future generations, empowering local communities, and cultivate harmony between environmental responsibility and economic yield”. They are investing in large-scale plantations of *Jatropha Curcas*, a tree that produces non-edible nuts high in oil. Crude *Jatropha* oil can be used as a drop-in replacement of traditional diesel. In any marine grade diesel pre-combustion engine such as almost all of the mining equipment, railway, boat or truck on the African continent the *Jatropha* seed just needs to be pressed and filtered to be utilized. However, for our North American diesel engines the *Jatropha* oil needs to be refined before use. The company is buying lands that have not previously been in agricultural production. In Kenya they have secured 160,000 hectares and hope to obtain an additional 200,000; in Zambia 100,000 hectares are being placed into production.

Jatropha is attractive because it does not compete with the food market and can be intercropped with cattle, timber and various food crops by planting the trees 4-5 meters apart. The *Jatropha* tree is a sub-tropical, drought resistant shrub with the ability to grow in challenging environments. It will yield high oil content fruit for approximately 50 years. The fruit is roughly the size of an apple with three large oil bearing seeds.

Four percent of Bedford’s budget is allocated to humanitarian work such as building homes, dental and medical clinics, schools and food processing plants in the areas of the plantation locations. The areas where these plantations are located are heavily populated with young unemployed people. The plantation provides them with employment as well as a new food source with the ability of intercropping and planting on land that is not currently in production.

For more information on *Jatropha* or Bedford Biofuels go to <http://www.bedfordbiofuels.com>

Photo from www.bedfordbiofuels.com of *Jatropha* nuts.



When switching over from petrol-diesel make sure to check your fuel filter for added debris as biodiesel is a mild solvent and will remove sediment from the tanks and fuel lines.



Airlines Using Biofuels

In late 2010, Brazil’s largest airline TAM and Germany’s Lufthansa were two of the first airlines to use biofuel on commercial flights. TAM utilized biofuel created from *Jatropha*, and Lufthansa is supplied by Finland’s Neste Oil. Lufthansa used a 50/50 blend of kerosene and biofuel in a six month trial. Japan Airlines, Virgin Atlantic, Air New Zealand and KLM have also been experimenting with biofuels produced from *Jatropha* and other non-food feedstock such as coconut oil, algae and camelina.

American Airlines and United Continental Holdings, which also includes Alaska Airlines, FedEx, Frontier Airlines, JetBlue Airways, Southwest Airlines, US Airways, Air Canada and Lufthansa, have signed an agreement to use biofuel created by recycled urban and agricultural wastes, diverting it from landfills. British Airways will establish Europe’s first sustainable jet-fuel plant in east London with the intention of converting 550,000 tonnes of waste material a year, otherwise destined for landfills, into 16 million gallons of green jet fuel.

Continued on Page 3

Airlines Using Biofuels continued

The largest obstacle for airlines to use biofuel is production quantity. The biofuel industry needs to become more price competitive with traditional fossil fuels. The technology is there to increase production, which would also decrease costs, along with a wide array of feedstock availability and is very attractive due to large reductions in emissions.

Property Rights Task Force

On January 10, 2012 in St. Paul the Alberta Government Property Rights Task Force conducted an open house. The Task Force, chaired by Diana McQueen, Minister of Environment and Water, and vice-chaired by Evan Berger, Minister of Agriculture and Rural Development, were in attendance along with Jeff Johnson, Minister of Infrastructure, and MLA Arno Doerksen.

The session was well attended, and the public was divided into four groups and asked the following questions: “What are your concerns related to property rights (whether owner or lease holder)?” and “What are solutions and advice to the Task Force as it develops its recommendations?” Each group had a facilitator and a Member of the Legislative Assembly.

One of the first issues discussed was that of the consultation process itself. Having a public session during working hours limited the ability of many people to attend. The consultation process needs to be practical and the public needs to have access to good, clear and unbiased background information. In the past not all stakeholders were included in consultation. It was also felt that the government was pitting different groups against each other and that the language around consultation was divisive and corporatist.

Another issue is that property rights in Alberta are unclear. One thing that is clear is that people feel that their property rights have been steadily eroding. There are many misconceptions and no understanding of the bills that have passed or the context surrounding the changes that the Alberta government made. The public is lacking the history of land rights and perceive the government to be making changes arbitrarily. I think one of the most frightening phrases is “at the discretion of cabinet”. There is a lack of clarity surrounding the commonality of the ALSA bills. Discrepancies in regulations between crown and private land are numerous and create contention amongst land users.

The group I participated in was composed of people from a broad range of backgrounds. In the group there was a large representation from agriculture. Many producers felt that the Department of Agriculture has lost its ability to represent the needs of farmers. It was also questioned whether historical land users and farmers have lost the right to access the land. One of the most prevalent issue/concerns that was discussed was compensation; how a land owner / farmer / lease holder can possibly fight a battle against a large corporation or the government. Discussion around boards that are supposed to be there for the individual, such as the surface rights board or farmers advocate office, brought up the question of how people are appointed to these boards? Is it a fair and transparent process? And is there patronage, do they have to tow the government line? It was felt that regulations are unfair and restrictive laws are in place to remove any process of legal action against the government. The bill of rights from 1960 states that there is a right to due process, but what is the definition of due process? There is also a lack of clarity surrounding the “public interest” and who decides what that interest is. Land evaluations appear to have no goodwill considerations, and compensation is neither fair nor timely with no thought to future impacts. The individual has diminished rights to arbitration and is the small player on an already unlevel playing field.

Some of the advice and solutions discussed were that property rights need to be enshrined and clearly defined with due process. Stewardship commonalities such as air, water and soil need to be protected without dichotomy. Expectations need to be clear regarding stewardship and apply to everyone with effective and timely enforcement. Any definitions, such as marginal land, need to be clear and understandable. It was felt that the expropriation act needs to be brought back. Compensation needs to be fair and third party defined. Long term planning must occur with regard to future impacts and not look at the quick money, but what is better socially and ecologically. The government needs to do a better job assessing impacts with more focus on the people and less on the business. It needs to recognize the cost to society when community centers, curling rinks, and recreation centers cannot keep the lights on. The government needs to stop pitting Albertans against each other. There needs to be consultation before implementation. There has to be work on relationships and foster partnership between ministries such as environment, industry and agriculture so they stop working independently of each other. These partnerships should also extend into private sectors as well.

If you have any thoughts that you would like to submit you can email propertyrights@gov.ab.ca or call toll free 310-4455 or mail
Property Rights Task Force
c/o Diana McQueen Minister of Environment and Water
425 Legislature Building
10800-97 Avenue
Edmonton Alberta T5K 2B6



FIELD TO PUMP TECHNOLOGIES

On December 15th, 2011 in St. Vincent an information session was held regarding the proposed biodiesel plant to be built in the Smoky Lake region. The second proposed plant will be located near High Prairie. Each plant will have the capacity to produce 66 million litres per year of ASTM certified biodiesel. Each plant will create 50 direct jobs, along with construction employment for approximately 9 months for around 50 people to build the plant. The economic impact assessment indicated the plant would figure at around \$220 million per year. The plant is built in modules, and when in production is a continuous process which reduces costs and minimized start-up and shut down. The plant, at full capacity, would produce 66 million liters per year, needing an average of 11 super Bs of feedstock per day, but would work up to full capacity over several years. The biodiesel made at the proposed plants in Alberta would be RFS2 certified which would allow export to the United States. All biodiesel would be third party lab certified. This plant would require first grade canola to start up but then would rely on off-grade canola and a variety of other feedstocks. The plant will offer producers another avenue to move oilseed that is green and/or has been frozen or heated and that traditional markets do not want.

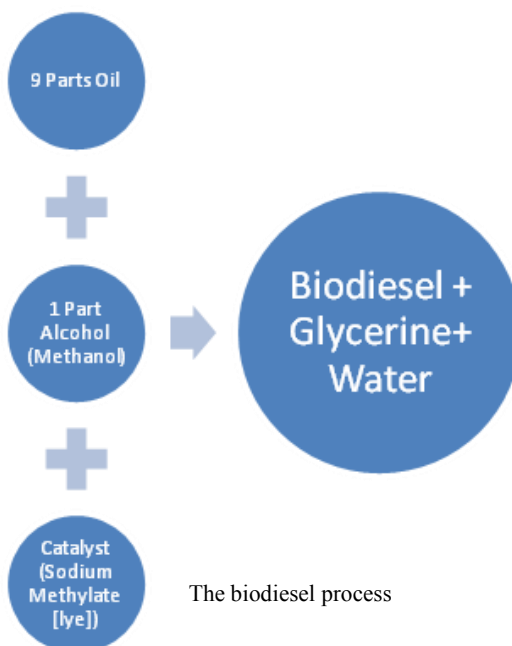
Out of all fuel types, liquid fuel provides the most consistent energy source and usually has the cheapest method of distribution. Even in a coal plant diesel is consumed to start up the generators or burned to supply any shortfall of energy requirements. There is a 4 trillion dollar market for liquid fuels. The Canadian government legislated that there must be 2% blend of biodiesel in 2012. This equates to roughly 180 million litres per year. Currently Canada imports all biodiesel from Brazil. In Europe biodiesel is currently blended at minimum of 5%. In the United States nearly 10% of all fuel consumed is biofuel (biodiesel and ethanol). Automotive companies are improving engines and warranting them to 20% biodiesel blends.

Biodiesel produces 78% less CO₂ than regular diesel. Biodiesel results in roughly the same mileage as diesel, but due to a higher cetane number and higher oxygen content it has improved ignition resulting in lower emissions. Compared to low-sulphur diesel, biodiesel has a lubrication quality which can reduce wear and increase longevity of an engine.

Biodiesel can be produced by a variety of feedstocks such as animal tallow, oilseed crops, recycled restaurant grease, and biomass such as algal blooms. In Michigan, where TPA (The Power Alternative) has an operational plant, they are growing pennycress (stink weed) on marginal lands such as abandoned industrial sites, road side ditches and small parcels of land in the inner city. Since many of the industrial sites are contaminated, the crops are non-food safe. They use the meal from these crops as a soil amendment and sell it as a biological fertilizer. Cold weather crops produce better cold performance fuel. Certain varieties of pennycress have rated to -28°C.

The end products from the production process are biodiesel, glycerine (glycerol) and water. Glycerine has a wide range of uses from soap, pharmaceuticals, food additive, antifreeze, and chemical intermediate. It is also used as a dust suppressant on roads. Glycerine would be a second marketable product from this plant, in addition to biodiesel.

For more information on this plant go to www.thepoweralternative.com.



The biodiesel process

LARA Research Update and AGM

**March 1st 2012
Mallaig Unity Centre**

4:00 pm

**Annual Reports and 2011 Research Results
will be Available**

Please RSVP 780-826-7260

Farmer Appreciation Night

February 10, 2012

Glendon RCMP Hall

Doors Open at 5:30

Dinner at 6:00

Entertainment to Follow

Pre-Registration is Required

780-826-7260

State of the Watershed Input and Information Session

The Beaver River Watershed Alliance will be hosting public information sessions in Craighend and Bonnyville regarding the State of the Watershed Report. Come and review information on your watershed and have your input. Sessions will be held in Craighend on February 28 and Bonnyville on February 29. Info sessions will provide dinner and start at 5:00 pm.

Upcoming Events

Environmental Farm Plans

The environment is becoming a more prominent issue. It is a large factor in marketing agriculture and food products in today's global markets. Consumers are demanding more transparency and are demanding high quality and safe products. Reputation of food safety is critical to retain and gain access to domestic and international markets.

Environmental Farm Plans (EFP) provide a tool for producers to self analyze their operation and identify environmental risks, current standards, areas for improvement and also highlight what they are doing well.

Having a completed EFP allows producers to access different funding opportunities, such as the Growing Forward Stewardship Program. It is also useful in product branding that demonstrates specific environmental standards.

The EFP Process

An EFP can be completed through workshops or one-on-one session(s). The EFP first identifies the soil and farm site characteristics. Following this, the producer completes only the relevant chapters that apply to their operation; such as wintering sites, fertilizer, pesticides, crop management etc. Upon completion the EFP is submitted to a Technical Assistant for review. Once reviewed the EFP will be returned along with a letter of completion.

The EFP is a living document and should be reviewed and updated periodically.

If you wish to complete an EFP or have any questions regarding EFP please contact the LARA office at 780-826-7260



**Check out what is new
with Growing Forward at
[http://
www.growingforward.alb
erta.ca/index.htm](http://www.growingforward.alberta.ca/index.htm)**

High efficiency washers have a condensate drain that is very acidic. This can corrode your pump. You may need to install a neutralizer filter which contains limestone.

Septic and What it Means to You

Septic failure is probably more common than you think. Having sewage on the ground where you and your family live can cause a multitude of problems: not only will the odour be offensive, sewage can create severe health problems and could potentially contaminate your soil, groundwater well and surface water. If sewage contaminates your well, your water supply could be infected with pathogenic and non-pathogenic bacteria such as salmonella and *Escherichia coli* (E. coli); viruses such as norovirus or hepatitis; protozoa such as *Giardia* (Beaver Fever); as well as nitrogen and phosphorus. These bacteria and parasites can cause gastrointestinal illness, fever, vomiting and diarrhea, and kidney failure. It can be fatal to the elderly, infants or people with compromised immune systems. Blue Baby Syndrome could occur in infants under six months of age or pregnant women who are exposed to high level of nitrates in the water. The nitrates, when digested, form nitrites and bind to blood cells decreasing the supply of oxygen to the body.

When sewage enters water bodies such as lakes, it will change the amount of dissolved oxygen in the water and this can cause fish to die. It will also cause blue-green algal growth which produces a toxin that can cause skin rashes and force the closure of recreation on that water body.

A toilet that is leaking at 1/4 gallon/minute equates to 360 gallons/day. Which is what a three bedroom house septic system would be sized to.

There are many factors that can cause septic system failure. The first is not having sufficient capacity. Having proper capacity increases retention time allowing microbes to work more effectively at breaking down waste. Many houses have their septic systems sized and installed before adding a water treatment system. Conditioning systems can add 145 gallons per day as clear water waste. You would want to prevent additional flow volumes from water conditioning systems, iron filter backwash, drainage/weeping tiles, storm water, hot tubs and swimming pools from entering your septic system.

Your septic systems ability to handle sewage can be affected by adding things to your system that don't break down or that add too much organic material. An in-sink disposal can add 50% more organic and inorganic load to your system. Reduce or limit:

- Vegetable or fruit scraps and coffee grounds
- Avoid flushing facial tissues, tampons, condoms
- Limit strong disinfectants and soaps (too much bleach and chemicals can cause you to have to pump your sludge more frequently)
- Avoid high efficiency detergents with surfactants
- Cooking oils and grease can plug filters or soil (in field)
- Paints, pesticides, poisonous material and other chemicals
- Pharmaceuticals
- Biodegradable toilet paper (the kind for RVs)

Protecting Your System

Septic tank additives often advertise that they reduce the



Picture of Bacon Cooking



SEPTIC CONTINUED

need for regular pumping of your system but where does your waste then go? Additives may increase biological activity to break down your sewage but may cause more gas to be created and will prevent the settling out of the tank which increases the amount of suspended materials getting to your soil (field system) and plugging it off. Some additives can contain emulsifiers that will cause grease/oil to not float out of the tank and get to the soil component. But additives can also be detrimental in that they contain fillers which can actually add sludge to the tank.

In a field system prevent traffic over the system. Soil compaction will lead to system failure as it prevents infiltration. In the winter snowmobile traffic can push the frost down and cause your system to freeze.

Proper maintenance is essential for your septic system. Having your tank pumped for scum and sludge regularly (such as an annual basis) will prevent field failure. It would be beneficial to install a sludge detector which will provide an alarm as to when to pump your tank. A good sign that you need to pump your tank is when your toilet starts to flush very slowly or you hear a gurgling sound in your sink. When your tank is pumped you should inspect your tank for leaks and cracks as well as damage to your inlet and outlet baffles and make sure your pump and float are free of debris. Effluent filters also need monitoring and maintenance to avoid plugging off. If you have an alarm installed, check it annually to make sure that it is working. Remember that septic systems are ultimately the owners responsibility. If you suspect a septic failure or find sewage on the ground please report it to Alberta Health Services.

HEMP CONTINUED FROM PAGE ONE

are becoming very popular as they have a very high protein content, or hemp oil.

General recommendations for growing hemp are:

- Seed as early as possible

- Be aware of seeding density as it will affect the yield of fibre and ratio of short to long fibre content.

- No recommended herbicide, but hemp is an effective weed suppressor.

- NPK ratio is 100:50:60 kg/ha with P and K more important for seed production.

- Harvesting hemp soon after pollen is shed to have higher quality fibre. As plant becomes more mature the lignin content increases, decreasing fibre quality.



Hemp has a well developed root system and is very efficient for uptake of water. The root system also increases soil organic matter and improves soil texture. The average growth rate on a hot sunny day is 15 centimetres/day. Some varieties of hemp can grow over 3 metres tall. One hectare of hemp has enough fibre to build a modest house. Hemp has many attractive qualities as it produces fibre with high thermal inertia (fire retardant), high thermal insulation, good vapour properties, pest resistant, low density, net carbon capture, and is a renewable resource. It is very competitive with fibreglass as it is lighter (can provide better fuel efficiency in automobiles), recyclable (end line recovery and reuse of trim waste), has great structural

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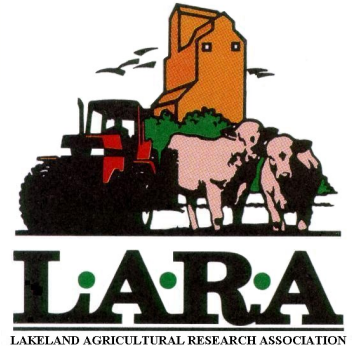
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Sustainable farming encompasses a wide range of practices and principles; combining environmental stewardship with profitability and ensuring that the family farm will be there for



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HEMP CONTINUED FROM PAGE 7

strength and can look like the legacy product (made from fibreglass).

Alberta has a great opportunity as the biofibre market has a huge potential for growth. Geographically it is in a great position to enter the US markets especially since US policy bans the growth of hemp. We have a cost effective raw material supply base of many feedstocks such as hemp and flax. Canada is faced with a chicken and egg dilemma of producing a product that has a no market and no market because we have no feedstock. The Alberta Innovates Technology Futures had a \$15 million initiative to set up the Alberta Biomaterials Development Center (ABDC) in Vegreville Alberta. It has a goal to go from “seed to final product” which encompasses feedstock development, fibre processing, biocomposites development, and market development. At ABDC they have the ability to conduct demonstration scale processing bridging business and technical aspects together and working towards solving the situation of the chicken and the egg.

If you would be interested in a tour of ABDC please let me know.

