

DELTA BARLEY FOR FUEL

Makes Sense in Interior Alaska



A Biomass Project at Fort Greely

Achieving

State Goals for Agriculture

And Federal Directives for Alternative Fuels

A Salcha/Delta Soil and Water Conservation District Proposal

August 2011

Vision

A cost-effective and sustainable biomass project at Fort Greely that uses Delta barley for fuel for heating buildings, thereby

- **adding value** to Alaska's agricultural industry,
- stimulating and stabilizing the **local economy**,
- addressing Alaska's commitment to **develop renewable energy** resources, and
- meeting federal **directives** to introduce alternative fuel sources in new construction at federal facilities and installations.



Achieving State and Federal Goals

State of Alaska Goals for Agriculture

- 1980 500,000 acres in crop production by 1990.
- 1981 HCR 29 included the following statements as part of seven strategic goals to guide agricultural development in the state:
- **Provide employment** for Alaskans,
 - Develop a **self-supporting agriculture** industry in Alaska, and
 - Ensure that agricultural development proceeds with **sound environmental practices** and energy efficiency.

State Goals for Increased Development of Renewable Energy

- 2003 Alaska State Legislature commissioned the Alaska Energy Policy Task Force to develop a long-term energy policy which established goals to “promote research, development and demonstration of clean and renewable energy” and to “increase the proportion of renewables in long-term fuel sources.”
- 2006 Renewable Energy Alaska Project Energy Atlas
- “Renewable energy sources provide low-risk energy that, over the long term, can lower costs. With some of the best renewable energy resources in the country, Alaska has an opportunity to be a leader in their development and bring new revenue streams into the state’s economy.”
- “It is also possible that Alaska’s agricultural lands may be used to produce energy crops...”**

2008 Federal Energy Management Program

Bottom Line:

Federal facilities and installations must meet part of their energy needs from renewable fuels.

Delta Barley

Consistent Crop Choice Reduces Oil Use

Barley as a Fuel is Earth-Friendly

- Barley is an ideal renewable resource—it is **easily grown, harvested and stored.**
- Delta barley as an alternative fuel source will **reduce costs** and be **gentler on the environment.** The land is cleared and available for increased annual production to provide more than feed for livestock.
- Area farmers are shifting to no-till operations. **No-tillage is carbon-friendly** because the carbon is sequestered in the soil, thereby making barley earth-friendly. No-tillage reduces carbon dioxide emissions.
- Barley ash contains the same nutrients needed for crop production so it can be returned to the soil.
- Harvest **cycle of one year for barley** beats the 120-year cycle for mature trees in Alaska.
- **Consistent moisture levels of 13%** are far less than whole tree wood chips which can vary from 30% for mature trees.
- Consistent moisture makes the **boiler system more manageable, particularly at cold temperatures** when high moisture content can lead to fuel freezing.
- Fort Greely's heating need averages 220 billion BTU/year. 15,000 tons of barley can meet that need. The 10-year average yield is approximately a ton per acre.
- Barley is **safe to ship and store** and requires no hazardous materials posting and fees.
- Delivery is convenient with **locally available storage.**
- Storage for barley has a smaller footprint due to its higher density.
- Barley needs **no additional processing**, which saves time and money.



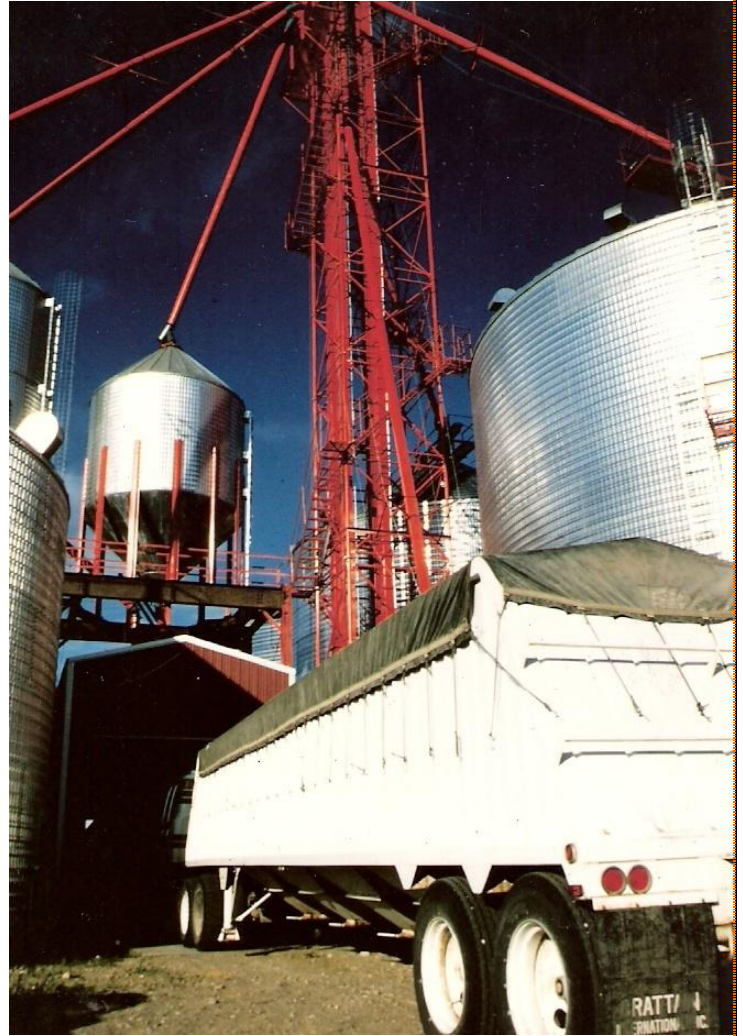


Barley Compared with Fuel Oil

- The BTU content of a bushel of barley **equals 3.1 gallons** of fuel oil.
- Barley is half the cost of fuel oil per million BTU (MBTU).
- New federal mandates require the use of renewable fuels in federal installations and facilities. The convenience of using barley is as close to petroleum products as you can get. It is easy to handle, to store and to truck with manageable operation costs.
- The Numbers
 - 393,600 BTU's per bushel of barley
 - 125,000 BTUs for mandated use of low sulfur fuels
 - Fort Greely: 220 billion BTU/year requirements**
 - 2010 estimated diesel fuel cost/gallons = \$5.5M/1.9M gallons
 - Equivalent barley fuel cost = \$2.8M

Storage Accessible and Secure

- The Alaska Farmer's Cooperative is located 18 road miles from Fort Greely.
- Current storage at the Cooperative allows for 8,000 tons.
- Surrounding farms currently have additional storage capacity of 9,000 tons.
- Storage capacity to meet the needs of the project can be expanded.
- A **one-year grain reserve**, as a buffer, would **secure the grain supply**.
- Barley is an extremely reliable crop for Delta.
- Fort Greely's boiler will require **15,000 tons annually** to meet its 220 billion BTU heating need.
- The **footprint of delivery and storage is small** because of barley's high density.
- A bin to store **a week's supply of barley fuel** would have a **footprint of only 572 square feet**. In addition, the daily consumption of barley for a 25,000-pound boiler can be met by delivering **one truckload a day**.



Capacity^{and} Enthusiasm of the Delta Farming Community



- Today the USDA Farm Service Agency shows **71,000 available acres** as cropland in Delta. There is plenty of farmland in the area.
- Current production of **5,000 acres of grain meets 2011 in-state market demand for barley as feed for livestock.**
- There is no choice between food and fuel. Both needs can be met easily given the state's 1980 decision to invest in agricultural development.
- **More than 50,000 acres of fallow or unplanted land** could easily be put into production in Delta, but is not due to a lack of market.
- This project can be a **model for meeting federal and state industry goals** by drawing on the land's intended use, benefiting local economy, saving money, and reducing our dependency on oil.

"My family came to Alaska in 1953 to farm. Getting a good-sized market is the key to getting crop production up which can only improve the quality of life for all of us in Delta. My neighbors and I want to do all we can to keep the farmland planted and the industry strong. This biomass project can give us a strong anchor market that will allow greater stability, not only for the bio-fuel market, but even for increasing feed production."

GARY SONNICHSEN, Granite Creek Farm

"We have been in the farming business in Alaska since 1982, producing small grains and grasses. Any increase in the usage of our agricultural products and the resulting increase in demand would be met with an increase in local production. A biomass project would be a welcomed addition to our markets, and would benefit the Delta farming community."

MIKE SCHULTZ, Schultz Farms



Economic Impact

\$20 Million into the Area

- 15,000 acres of new production of Delta farmland would generate **\$2.8 million in direct sales annually**.
- The agricultural multiplier suggests **up to \$20 million** could be injected into the local economy.
- Jobs—opportunities for farm-related employment and income helps **build Alaska's workforce in rural areas**.
- Farm-related jobs and activities for **youth** mean youth can choose to **remain in their community** and have a livelihood as they will have the skills to take on future jobs. Family farms can be passed on to the next generation.
- **Prototype** for other small communities across the state.
- This biomass project at Fort Greely will reduce about 1.9 million gallons in oil imports and save **almost \$3 million** of taxpayer money every year.
- **Biomass fuel costs are far less than fuel oil over the long run.** Barley's added value includes security of the source as freezing **temperatures are not a factor** during the coldest five or six months of the year. Barley has a low consistent moisture content which makes it easier on the boiler's year-round operation and for long term storage.
- **This is an opportunity for the state's investment in agriculture to pay off.**

It creates a new market, stabilizes the industry and brings in outside dollars. Increased revenue will stimulate production of other crops as



farmers will have funds to take risks. For the long term, increased agricultural production could increase food security in Alaska.

Agriculture in Alaska

- Barley has been grown successfully in Delta since the 1950's.
- In 1978 the State of Alaska committed to a **plan for development of renewable resources**:
 - to **diversify the economic base for the state**,
 - to increase the ability for Alaska to **grow more of its own food**,
 - to increase **opportunities for employment** in rural Alaska.
- The **plan also envisioned**
 - development of 500,000 acres for crop production with **150,000 acres in Delta**, and
 - the **export of its surplus production**.
- Although 86,000 acres in Delta were sold and cleared, the **export market never materialized**, leaving thousands of acres unplanted.
- Alaska's **agriculture industry has yet to develop its full potential**.

BOTTOM LINE

- This project **can boost the industry significantly**—keeping families together and farms thriving. Barley as a fuel has a short turn around to success—one year. The pieces and technology are in place. **Land is cleared** and available to plant. Fort Greely could have barley delivered as a fuel year-round at **half the cost** of diesel. Alaska could begin to realize a return on its investment in agriculture.

Delta Agriculture

